DOCUMENT RESUME

ED 040 940 SP 003 981

AUTHOR	Mager, Robert F.; Pipe, Peter
TITLE	Teacher Training Projects of the Regional Educational Laboratories.
INSTITUTION	Mager Associates, Los Altos Hills, Calif.; Oregon Univ., Eugene. Center for Advanced Study of Educational Administration.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
BUREAU NO	BR-5-0217
PUB DATE	69
CONTRACT	OEC-4-10-163
NOTE	132p.
EDRS PRICE	EDRS Price MF-$0.75 HC-$6.70
DESCRIPTORS	*Administrative Policy, Developmental Programs, *Educational Development, Management Development, *Regional Laboratories, *Research and Development Centers, *Teacher Education, Teacher Educator Education, Teaching Programs, Teaching Techniques
IDENTIFIERS	DEL, Division of Educational Laboratories

ABSTRACT

Prepared in 1969 for the Division of Education Laboratories (DEL), this report examines the teacher training programs and projects of the 15 educational laboratories and three selected Research and Development Centers, established to systematically develop ideas and technology relevant to educational problems. The procedures involved reviewing Office of Education documents describing the mission of the laboratories, reviewing documents submitted by the laboratories and making site visits. Topics studied included: 1) action in teacher education; 2) problems encountered; 3) results achieved; 4) cooperation and competition between laboratories; 5) duplication of effort; 6) sources of ideas and personnel; 7) ways of strengthening teacher education programs. The projects studied are those "whose primary aim is to change or add to the capability of a teacher or teacher trainee, or whose primary intent is to develop materials designed to change or add to the capability of a teacher or teacher trainee," and three main classes were identified: 1) teaching teachers how to teach; 2) teaching teachers how to use products; 3) teaching teachers to teach others to teach or to use products. The work of each laboratory is briefly examined and the problems which they all face are discussed, particularly the nationwide lack of emphasis on teacher effectiveness as evidenced by student growth. Fourteen specific recommendations for future developments are made. (MBM)

MAGER
Associates

ED 040940

TEACHER TRAINING PROJECTS OF THE REGIONAL EDUCATIONAL LABORATORIES

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

A subcontract pursuant to
Contract No. OE 4-10-163

Robert F. Mager
Peter Pipe
September 1, 1969

The work reported here was completed as a subcontract with the University of Oregon pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent officical Office of Education position or policy.

MAGER ASSOCIATES
Los Altos Hills, California

SP003981

TABLE OF CONTENTS

Page

Preface iii

1. Introduction 1

2. How Can We Summarize Teacher Training Activities? 5

3. What Are Laboratories Doing About Teacher Training? 8

- Appalachia Educational Laboratory 11
- Center for Urban Education 13
- Central Midwestern Regional Educational Laboratory 17
- Eastern Regional Institute for Education 21
- Education Development Center 24
- Far West Laboratory for Educational Research and Development 29
- Mid-Continent Regional Educational Laboratory 34
- Northwest Regional Educational Laboratory 38
- Regional Education Laboratory for the Carolinas and Virginia 42
- Research for Better Schools 47
- Southeastern Educational Laboratory 53
- Southwest Educational Development Laboratory 56
- Southwest Regional Laboratory for Educational Research and Development 61
- Southwestern Cooperative Educational Laboratory 65
- Upper Midwest Regional Educational Laboratory 69
- Research and Development Center for Teacher Education 73
- Stanford Center for Research and Development in Teaching 78
- Wisconsin Center for Research and Development for Cognitive Learning 86

Page

4. What Can Be Said About Development Procedures? 93

5. What Are The Problems In Getting The Work Done? 97

6. What Effect Are Laboratories Having On Teacher Education? 103

7. How Do Laboratories Cooperate Or Compete? 107

8. What Is The Extent Of Duplication Of Effort 109

9. Recommendations 110

Appendix A - Description of Survey Procedure 123

Appendix B - Definition of Teacher Training 126

PREFACE

During the spring of 1969, the Division of Educational Laboratories (DEL) requested that during the following summer a summary be prepared of the teacher training programs and projects of the fifteen educational laboratories and three selected Research and Development Centers. This document reports the nature and results of this project.

It was made plain at the outset that this report was not to be either an evaluation of the laboratories and centers or a direct comparison of their strengths and weaknesses. DEL is evolving techniques for gathering information. It sought a "cross-institutional assessment of one substantive area," a quick assessment of what all were doing in the area of teacher training, rather than an in-depth appraisal of everything being done by one or more of these institutions.

It should be noted that the report is a "slice of time" view of what the laboratories and centers are doing, much like a photograph which captures a moment in the life of the objects depicted. Because of this, the report will be slightly out of date at the time it is first read by others. The laboratories will not stand still, but will be doing more and more in the area of teacher training as various projects mature. Our summary should be reviewed in this light.

Though more detail is included in Appendix A, a few words about the analysis procedure may help the reader at this point. In general, the procedure involved reviewing Office of Education documents describing the mission of the laboratories and centers, reviewing some of the documents submitted by the laboratories in response to a May 8th memorandum from DEL to the laboratories, visiting the laboratories and centers for one or two days each, and then collating and summarizing the information gathered.

This was a less than straightforward task, for a number of reasons. For one thing, though we received several wheelbarrows full of reports, memoranda, and brochures, few provided a succinct summary of laboratory activities. For another, visits during the summer meant that several teacher education projects could not be reviewed directly. For a third, there is less than full agreement among laboratory and center personnel about what constitutes teacher training; as a result, some time was consumed in reviewing projects which had little to do with teacher training, although it might be argued that they were developing information which ultimately might be used in teacher training. Thus it was decided to define teacher education projects in a manner that would preclude reporting on everything that laboratories and centers are doing.

To improve the likelihood that specific information about teacher training activities would be accurate, draft descriptions of these activities were submitted to laboratories and center directors for their correction. Recommendations were not submitted for such review as they are clearly labeled in this report as such and can be discounted by the reader whose convictions they do not confirm.

Three other steps were taken to minimize the bias of observations and interpretations. One was to have each site visited by one of three people rather than have all sites visited by a single person. A second was to provide each site visitor with an analysis guide so that the same questions would be asked at each location. A third was to have an instructional technologist who is also a writer-editor (Peter Pipe) assigned to the task of understanding the information collected by the site visitors and of preparing that portion of the first draft which specifically describes teacher training activities.

Dr. Vincent N. Campbell and Dr. William Deterline conducted many of the site visits, drafted their observations into documents which were the basis of this report, compared impressions and reviewed the final draft. To them we are deeply grateful. Though Peter Pipe and myself prepared the final report it was the trained observation of these investigators that is responsible for much of the accuracy of the information contained herein.

Many laboratory personnel were very patient in helping us understand what they are doing. They explained, and re-explained. They corrected verbal summaries and hunted up documents. Many were eager to have us put hands and eyes on the visible artifacts of their activities. To them we owe our thanks.

And finally, though my co-investigators did much of the work and although the editorial "we" is used throughout this report, tradition demands that we greedily reserve for ourselves all responsibility for error and omission. So be it.

Robert F. Mager
Peter Pipe

1. INTRODUCTION

The regional educational laboratories were established by the Office of Education as flexible and semi-autonomous institutions with long-range commitments (but only year-by-year funding) of support. The intent was that they should tackle problems which, because of their complexity or long-range nature, required sustained efforts by teams of persons. The laboratories were directed to break down barriers which traditionally divide individual research interests and to develop multi-disciplinary groups which would routinely use state-of-the-art development procedures. They were to evolve themselves into educational developers and product engineers. They were also to insure that the knowledge generated by research was not only transformed into products that worked while under their control but which also would work when under the control of the intended user. The laboratories were charged with designing and executing programs which would culminate in the production of thoroughly tested materials, procedures, and organizational forms for instruction and administration in schools. The developmental process was expected to be rigorous enough so that material, procedures, and organizational forms were modified and refined until they met performance standards. To facilitate achievement of these goals, laboratories were organized as institutions outside the direct influence of universities, departments of education, or local school systems.

Though laboratory missions differ, all are expected to engage in the systematic development of ideas and technologies relevant to educational problems, careful evaluation of the gains and cost of installing the new components and systems, and prompt communication to other educational agencies of the information essential to effective use.

Our charge was to report on the teacher training activities of the fifteen laboratories and of three research and development centers which are greatly interested in teacher education and which presumably are working in conjunction with one or more laboratories.

One of our first problems was to define "teacher training project." If we had taken as our definition, "any project which might conceivably have an impact on teacher behavior," we would have had to describe every project of every laboratory and center. This was not the intent of DEL. We adopted a definition of teacher training projects which can be paraphrased as "projects whose primary intent is to change or add to the capability of a teacher or teacher trainee, or whose primary intent is to develop materials designed to change or add to the capability of a teacher or teacher trainee." (For a full definition, see Appendix B.)

Our definition excludes studies designed to investigate the characteristics of teacher trainees, those designed to contribute to understanding the learning process, those concerned with understanding relationships between teachers and students, and those designed to change instructional organization.

We felt that it was within our province to comment on what is being done in teacher education and on how it is being done, but there is no intended implication that laboratories currently doing nothing in teacher education ought to be doing something, or that those doing something ought to be doing more.

Since the laboratories were set up as an autonomous organization, the whole of their funding does not necessarily come from the Office of

Education. There is, in fact, considerable variability in the amount of OE support. As our mission was to describe what the laboratories are doing in teacher training, we did not confine ourselves to OE-financed projects. To do so would have distorted the picture of laboratory activity.

A recent and searching analysis and summary of both the laboratory and the center programs was prepared by Dr. Francis S. Chase[1] of the University of Chicago. His report is recommended to all who would read an overview of all laboratory and center activities, and who would read a summary of strengths and weaknesses as they existed between one and two years before this report was prepared. This report was made available to us after our site visits were completed, and we were pleased to discover a general agreement between his and our observations. Further, we were pleased to find that there has been improvement in several of the areas identified as problems or weaknesses. This discovery is highly encouraging and testifies to the virility of the laboratories and to the increasing skill with which they are being managed.

Plan of the Report

Information is organized under questions DEL suggested the reader is likely to ask.

Section 2 is a brief summary of our findings. Section 3 describes current activities in teacher training of the fifteen laboratories and three R&D centers visited. Since the major purpose of the report is to provide information on teacher education activities this section reports such activities of laboratories and centers separately. It was not easy to reduce documents, notes, and impression to brief descriptions but we felt that lengthier descriptions of what each laboratory and center is doing in teacher training would defeat the purpose of the report. To fulfill the spirit of DEL intent, we have tried to present enough information to give the reader an impression of the nature and scope of teacher training activities of the various institutions.

---

[1] Chase, Francis S. The National Program of Educational Laboratories. Final Report, December 17, 1968, The University of Chicago, Contract No. OEC-3-7-001536-1536, U. S. Office of Education.

Sections 4 through 8 summarize information relating to the remaining questions. These Sections, however, treat the laboratories as a single entity; there seemed little point in doing otherwise. Moreover, it was prudent to disguise the source of much of the information offered.

Section 9 offers our recommendations. These recommendations vary in scope, and are offered jointly by the investigators, who are convinced that the strengthened existence of the laboratories is important to the future of American education.

It made minimal sense to try to confine recommendations to those that might have an impact specifically on teacher training projects. Besides, the charge was to offer recommendations that might strengthen the laboratory program so that is what was attempted.

2. HOW CAN WE SUMMARIZE TEACHER TRAINING ACTIVITIES?

Teacher training projects at the laboratories and centers range from those designed to help the teacher understand himself to those which provide him with a specific skill related to the use of an educational product (such as language training materials). They range from workshops operated by laboratory personnel to self-contained units operated by the teacher-trainee. They range from redesign of a teacher candidate's first college course on teaching to creation of in-service units for the experienced administrator.

We found three general classes of projects in teacher training. Their concerns were:

1. Teaching teachers how to teach. (These projects ranged from helping a teacher trainee to understand himself to developing specific behaviors in the teacher trainee.)
2. Teaching teachers how to use products. (These ranged from teaching teachers to use a product in the classroom to teaching administrators how to install and oversee the use of such products.)
3. Teaching teachers to teach others to teach or to use products. (These are mainly designed to help college teachers develop in others the skills needed to implement instructional products. These constitute a small percentage of the teacher training activities.)

With some diffidence, we have prepared a one-page summary (Table I) to try to indicate the extent and nature of teacher training activities. A description of the categories follows:

- 1. Personnel indicates the number of full- and part-time professionals currently employed. These numbers fluctuate and should be considered an approximation.

- 2. Percent Effort on Teacher Training shows how much of the institution's resources are currently devoted to teacher training activities. These numbers were provided reluctantly by some managers and should be considered suggestive rather than definitive.

- 3. Teacher Training Goals indicates whether the main objective of the teacher training activities is to teach skills or understanding, to use products, to teach others to teach or use products, or to change teacher attitudes.

- 4. Main Vehicle for Training indicates whether the principal vehicle of teacher training is a workshop (or seminar) or a self-contained instructional unit.

- 5. Source of Instruction indicates whether the training is carried out, in the main, by laboratory or center personnel, by teachers, or by outside consultants.

As many institutions have more than one teacher training activity there may be more than one mark in Categories 3, 4, and 5.

It can be seen that about one-third of the entire effort by laboratories and centers is currently directed toward some form of teacher training and that most of this training takes the form of workshops taught by the institution's own staff.

TABLE I

SUMMARY OF TEACHER TRAINING ACTIVITIES

	Laboratory															Center		
	AEL	CUE	CEMREL	ERIE	EDC	FWLERD	McREL	NWREL	RELCV	RBS	SEL	SWEDL	SWRL	SWCEL	UMREL	Austin R&D	Stanford R&D	Madison R&D
1. Personnel																		
Full-time	48		63	38	168		27	45		41	20	105	61	10	37	15	6	
Part-time	3		28	5	46		12			20			17		8	75	23	
2. Percent Teacher Training	2		22	35	33	75	75	40		6	5	20	7	11	55	80	20	
3. Teacher Training Goals																		
To teach			X	X		X		X							X	X	X	
To use products		X							X			X	X	X		X		X
To teach others					X					X								
To change attitudes							X											X
4. Main Vehicle for Training																		
Workshop		X	X	X	X		X	X	X	X	X	X	X		X	X	X	X
Self-contained unit						X				X						X	X	
5. Source of Instruction																		
Laboratory Personnel		X	X	X	X				X	X		X	X	X	X			X
Teachers					X		X		X	X								X
Consultants				X	X		X	X				X						

3. WHAT ARE LABORATORIES DOING ABOUT TEACHER TRAINING?

What are regional laboratories doing about teacher training? That was the prime question for this survey, and an important question it is, in this final third of the twentieth century. For Johnny Jones and his classmates are growing up in the era of exploding knowledge and exploding social problems. On their shoulders must fall the burdens of tomorrow. They must absorb the impact of scientific, technological, and social changes which have accumulated at an accelerating rate, leaving little doubt that even vaster changes lie ahead. Someone must prepare our young if they are to meet tomorrow's challenges and realize its promises. Traditionally, the teacher has been a prime source of such help. But he will not be able to prepare today's young for tomorrow's world by using yesterday's methods. Teachers, too, must change in a changing society. Old methods will not suffice. So the question is pertinent, What are laboratories doing about teacher training?

The quick answer to the question is, as we shall hope to show, that quite a bit is being done. Research centers and regional laboratories have been working on many innovative ideas and have recognized the need to provide training for teachers in the use of their new products and to train administrators and others to oversee the use. Those whose principal effort is directed toward teacher training see the teacher as the vital element in education and they regard teacher training as the most important activity one can undertake.

Regional laboratories are populated by people dedicated to solving some of the most pressing problems of our times. They are working, for example, to reverse the alienation of minority groups from our school systems, to improve the education provided to the poor of the ghettos, and to improve the relevance of teacher education programs to the actual job of teaching. Not all laboratories are working on problems that appear to us pressing or even, in our opinion, important. But most are -- more than enough to make the laboratory program worthy of strong support and nourishment.

Educational laboratories have some notable strengths. Like most relatively new organizations, they also have growing pains. They suffer, for example, for doing something that has not been done before. Unlike organizations that can hire a skilled plumber or physician as needed, the laboratories have no source from which to draw for adequate numbers of educational product developers. Neither universities nor other training institutions (with few exceptions) prepare or produce persons trained in developing effective instructional practices or products. Hence laboratories are struggling not only with the development of their organizations and products, but also with the development of staff. It is hardly surprising, therefore, to find a certain raggedness in the development procedures currently used. Products and procedures aren't always thoroughly tested before put into practice, and testing procedures rely heavily on teacher testimonials.

Problems other than those of recruiting and training also plague the laboratories. They operate on minimal budgets (if compared with the size and importance of their mission); they are required to run while hobbled by strange laws or policies regarding subcontracting, reproduction of reports, and use of test instruments; they must serve local needs while being evaluated by national standards; they must learn to work within their communities and inspire the cooperation of the target population members needed for developmental testing. A large challenge in any language.

But the laboratories also have strenghs. The boards which direct their activities contain many persons with long experience in a variety of areas, and the consultant lists are liberally sprinkled with names of people known to be skilled in instructional technology. The Office of Education itself provides assistance in the form of guidance and advice offered by its review teams and staff members. R&D centers appear interested in the problems of at least one laboratory each and provide guidance as well as help with development.

At last there are organizations whose specific mission is to develop procedures and products that work and that will have an impact on education within the lifetime of the developers.

Appalachia Educational Laboratory
1031 Quarrier Street
Charleston, West Virginia 25325

Mission

The mission of the Appalachia Educational Laboratory is to assist rural and isolated schools to upgrade their educational programs through development of cooperative relationships, supported by modern technology, for the adoption or adaptation of new instructional programs, initially including:

- A home-oriented pre-school program implemented through television and mobile facilities.
- A self-instructional vocational guidance system for Appalachian high school students supported by video tapes and microfiche equipment.
- An Appalachia-focused reading and language development program which includes animated films and television.

AEL is seeking an effective approach to the educational problems caused by the isolation and poverty of the Appalachian region. In concentrating on its regional problems, it has concluded that the region has a shortage of good teachers. Accordingly, it has largely rejected teacher-training as a solution to its problems and has instead emphasized the production of self-contained, "teacher-free" materials that can be used by a student with minimum involvement of a teacher. In addition, it has turned to the problem of disseminating its courses and now is concentrating on "course-sharing" by television and other means in an effort to bring more students into contact with its courses. Because there are few nursery or kindergarten schools in the areas of greatest need, much attention has been given to materials for early childhood and the early school years.

The three programs being prepared by AEL's 104 personnel are pre-school reading, an early childhood project providing instruction at home for pre-school children, and a vocational guidance program. All of these were identified by regional schools as prime areas of need.

In the pre-school program, a combination of elements is used. A mobile classroom, staffed by a teacher and a teacher's aide, travels through an area. The children watch a daily television program at home. A "home visitor" comes to the home once a week to deliver materials, tell parents what the child should do that week, and to administer tests. Objectives are set for each week. Concepts presented on television are discussed and worked with at home and in the weekly hour and a half spent in the mobile classroom.

Training for the home visitors was provided in a group workshop in which their basic procedures were described, and Psychodynamics, Inc. ran a sensitivity training course.

The vocational guidance program was begun because such counselling is sparse in the region. There is no education involved in this program. Students will be provided with printed and microfiche information about the world of work.

Center for Urban Education
105 Madison Avenue
New York, New York 10016

Mission

The Center for Urban Education is, as its name suggests, concerned with education in the big cities. Its mission is to create an interaction among universities, public schools, and local communities that will lead to better and more relevant education for the child of the city. To improve educational practice within metropolitan areas, its stated mission includes developing:

- Instructional materials, curriculum units, and teaching strategies;
- Community planning and participation to make schools more effective in a decentralized setting;
- Information about the problems facing urban education.

The chief concerns of the laboratory's staff of 180 have been curriculum development and community development. A visitor gains an impression of sympathy by the staff for the disadvantaged and for the difficulties of the layman. There seems to be a general attitude favoring community involvement in education, an impression confirmed by examination of the major project areas. In curriculum development, the goal has been to ensure early literacy. Activities have included development of a curriculum for disadvantaged pre-kindergarten and kindergarten children and testing of various approaches to beginning reading and early learning in science, mathematics, the arts, and social sciences. In community development, the aim has been to help metropolitan school systems in reducing inequalities in educational services and in fostering effective community participation in schools.

Teacher Training

By and large, teacher training has taken place within these broader projects. Until about a year ago, teacher training activities were mostly of a research nature, but, as in most of the laboratory's work, the emphasis is now shifting from research toward development.

The chief work with teachers has been to provide support and direction for teachers beginning work in an urban school. This is the Instructional Profiles Project. Experienced teachers have prepared "profile cards," one for each week of the school year, describing a goal for students and suggesting activities by which the child might attain the goal. From the spectrum of activities, the teacher choses those which best meet the ability levels of the children in her class. So far, cards have been developed for third grade and plans are to expand the system to adjacent grade levels.

Training in the use of the cards has been given by the card developers and by laboratory staff to about 100 teachers in three districts (one black, one Puerto Rican, and the other integrated). Another group of about 70 teachers received cards but no training, while a third control group received neither cards nor training. Training sessions of 105 minutes consisting mostly of lecture-discussion have been held every two weeks -- although training was disrupted by the 1968 teacher strike -- and feedback is gathered at these meetings both from observation and from reports by teachers on frequency of use, criticisms of content and form, and suggestions for modification. This feedback is being used to revise the cards.

A major project at CUE is "Planning for Change," a contemporary civics program focusing on the neighborhood and bring home to the fourth and fifth grader that he is a participant in his community. The program, prepared for CUE by Richard Hatch Associates, was field tested on students in 1968. Since then, revisions have been made to the student materials and training in the use of the materials has been given to teachers, supervisors, teacher trainers, aides, and parents. About 160 teachers and supervisors from six school districts have been involved. The Teacher Manual is explicit in its objectives for students, but the outcomes of teacher training are less so. Through training and use of the program, for example, teachers will be helped to "develop greater skill in using a variety of social science techniques." Probably because these outcomes are not explicit, they have not been formally assessed. The laboratory has tried to assess teacher attitudes, however, and it has strong, if informal, evidence of acceptance by teachers who want to participate and of interest from parents. The Center has also had four of its staff observing instruction in the program, conferring with teachers and others, and giving demonstration lessons.

In the pre-kindergarten and kindergarten programs, ten teachers and ten teacher aides have been trained in techniques devised to improve cognitive development. The training made use of filmstrips and video tapes made for the program and it included demonstration lessons, group discussions, and seminars.

In reaching out for community participation, one of CUE's most important purposes is to train parents to participate in the education process. Its work with the Spanish-speaking community has two main facets:

- With members of the Puerto Rican community, helping bilingual (Spanish-English) teachers to prepare materials appropriate for Spanish-speaking students and also helping teachers to form liaisons with the community.

- Jointly with the Puerto Rican Forum, training parents so as to increase their competency in the various roles they might play in bringing school and community closer together. Approximately 100 parents are involved. This project is expected to help the bilingual teacher project goal (above) of creating contacts between teacher and community.

The Center's "Identifying the Effective Teacher" film series is an attempt to discover the criteria of professional competence by which people judge teaching. A survey of parents, students, teachers, supervisors, and others, asked for the names of the most effective teachers, mainly in the Spanish-speaking Bronx. The list was narrowed to eight and after classroom observation the Center staff selected one of the eight to be filmed while teaching. The film of the teacher's unrehearsed performance has been used as a starting point of discussion of teaching styles with groups of college students, parents, and faculty.

Central Midwestern Regional Educational Laboratory
10646 St. Charles Rock Road
St. Ann, Missouri 63074

Mission

The Central Midwestern Regional Educational Laboratory is one which first determined its priorities in consultation with the educational institutions and agencies of its region. Two of the areas of interest so identified remain part of the laboratory's mission, although its scope has now been enlarged to the nation as a whole. Specifically, it is charged to contribute to the quality and breadth of curricula and instruction in the nation's schools, initially by developing:

- Comprehensive, individualized curricula in mathematics and esthetics for all elementary-secondary grades;
- Instructional systems for teachers of students with learning difficulties.

CEMREL employs 63 full- and 28 part-time professionals, and 39 technical and support personnel. Their chief activities are:

- A mathematics program which, when finished, will include teacher materials and individualized instructional materials for students in all grades of elementary and high school;
- An esthetics program, also covering all grades through high school and dealing with art, the theater, literature, music, and dance;
- A learning disabilities program which teaches teachers how to handle children with learning difficulties.

Teacher Training

The Learning Disabilities Program is primarily a teacher training program and is the major effort in teacher training for the laboratory. The target is any student having trouble learning -- not simply the culturally disadvantaged but the autistic, hyperactive, or overaggressive child, and others who have no label but who are having problems in school. Special techniques have been developed for students of normal or above-normal intelligence whose academic performance has been consistently poor. Teachers are trained through a workshop which includes observed practice teaching.

The other chief area for which teacher training is provided is the Comprehensive School Mathematics Program. When completed, the curriculum will be completely individualized, with a student's progress depending upon his performance. Materials are to include both remedial and enrichment paths. The activity packages make use of a variety of media. Use of the materials will require extensive teacher training. This training has begun, but in an informal and first approximation form, since full specifications for teacher training will not be determined until materials have been tested in schools, starting in the Fall.

The Esthetics Program, the only extensive program of its sort in the nation, is still in the early stages of development and teacher training needs have yet to be identified.

The Learning Disabilities Program is chiefly concerned with training teachers in techniques for helping children. Its development also encompasses either the preparation of new materials or specifications for adapting existing ones. The program employs the techniques of contingency management, using tokens or preferred activities as rewards when desirable behavior is demonstrated by a child. The techniques are designed to gain improvement not only in the student's achievement but in their social behavior through reduction of undesirable behavior such as fighting, tantrums, and withdrawal. Children are encouraged to help in specifying rewards and activities and in planning the contingencies in the classroom.

Instruction for teachers is provided through a workshop-seminar. This includes instruction in basic principles of reinforcement and in the arrangement of contingencies. After examples have been described and demonstrated, teachers practice with children and their activities are critiqued. Classes of desirable and undesirable behaviors by students are counted, and other data are also collected, all as indicators of the effectiveness of the teacher. Curriculum packages are being prepared to accompany contingency management training.

The laboratory has studied what students do as a result of teacher performance (rather than what the teacher does) and as a result the amount of theory in the workshop has been reduced and demonstrations and practice have been increased. Although the program is now relatively independent of the others in CEMREL, the instructional systems it develops will become part of other programs developed by the laboratory.

Although its three major programs have national implications, the laboratory also has several smaller activities which are regionally oriented. They include science workshops to brief some 200 teachers on the nature and use of the new packaged science kits for elementary grades, on the use of the individualized mathematics materials being developed by the laboratory, and some computer-programming and use courses for mathematics and science teachers. The science workshops are not strictly training so much as an orientation to expensive materials the teachers might otherwise not see.

The mathematics workshops are informally done; a complete teacher training project will not be undertaken until further field testing has been completed with the materials during the next school year. The laboratory feels that many questions about the role of the teacher and the training needed will be answered during the field testing. The computer training enables science and math teachers to teach their own students how to program and make use of computers in their own course work.

Eastern Regional Institute for Education
635 James Street
Syracuse, New York 13203

Mission

The Eastern Regional Institute for Education (ERIE) is concerned with "process-oriented education." This it describes as education aimed at developing a pupil's basic mental skills so that he will be able to continue learning throughout his life -- education concerned as much with minds "well-formed" as with minds "well-filled." The laboratory's mission is to increase student's ability to acquire and apply knowledge by developing curricula which stress the process of learning. Its mission calls for it to cooperate with a network of elementary schools and with colleges and universities to bring about effective use of process-promoting curricula. The program components include: (1) identification and analysis of such curricula, (2) their augmentation and testing in collaborative schools, (3) their validation through installation in pilot schools, and (4) their diffusion through a network of demonstration schools. The target groups are the pupils of more than fifty cooperating elementary schools now working with selected curricula in mathematics, reading, social studies, and science.

Teacher Training

In training teachers to teach process skills, ERIE has used workshops and institutes, followed in all cases by frequent visits to the trained teachers by ERIE staff and consultants (college professors trained by ERIE to help install new process curricula in elementary schools). This year's workshops have had the following purposes:

- Preparing professors of science and science education to serve as consultants and to promote curriculum change to Science--A Process Approach in regional schools;
- Preparing teams (a professor and laboratory school teachers) to lead pre-service and in-service education of teachers in effective use of Man: A Course of Study;
- Preparing teachers in grades K-5 to teach Science--A Process Approach;
- Preparing collaborative school teachers in Science--A Process Approach, SRA Social Science Laboratory Units, Man: A Course of Study, Minnemast mathematics, and an ERIE-augmented reading program.

The strategy for the collaborative school workshops has changed over the last couple of years from a theoretical approach to emphasis on practice, from the use of consultants as leaders to having ERIE staff and teachers themselves work with pupils and new materials, and from long general workshops to shorter specific workshops. ERIE has emphasized the training of principals and supporting staff at the same time as teachers so that they understand what it is they are trying to accomplish. In addition, teacher aides have been trained in supportive functions such as record-keeping and test-scoring.

ERIE's staff believes that all curriculum projects should be strong on teacher education. In general, process curricula adopted from elsewhere -- and throughout ERIE has tried to adopt existing materials -- have been lacking in effective teacher education materials. A major share of attention has been given to remedying this deficiency.

Project leaders at ERIE are less optimistic than some about the merits of training teachers to train other teachers, considering the difficulties which teacher-leaders encounter when they return to their schools. It has preferred to emphasize the direct training of teachers for involvement in curricular adoptions and has supplemented this training by visits from consultants. These consultants are ERIE staff or college professors, often science educators, who have been trained in the teaching of process skills for the general curriculum, not simply in a particular curriculum. The intent of the workshops is to get the professors to include emphasis on teaching process skills in their undergraduate courses and to enable them to assist teachers of satellite and demonstration schools in fostering these skills in pupils. At present, the professors' training is built around Science--A Process Approach and Man:. A Course of Study.

Limited formal evidence of changes in pupil skills is yet available, even though the Institute places its emphasis on refining learning skills in children. Some less direct (usually verbal) evidence is available in the increase in favorable attitudes among teachers toward individualization of instruction.

Education Development Center
55 Chapel Street
Newton, Massachusetts 02160

Mission

In that part of its activities funded by the Office of Education, The Education Development Center (EDC) has at once the briefest statement of mission and the largest staff of all the laboratories visited.

Its mission states that it will create improved systems of in-service training in both urban and rural schools. This is to be done by developing procedures to create instructional resource teams to provide such training.

Teacher Training

EDC's teacher education activities funded by the Office of Education are a part of the Pilot Communities Program, aimed at helping schools in selected communities improve the quality of education. The laboratory's projects in the social and physical sciences, funded by a variety of sponsors, also have broad interests in teacher education. Most of these projects have been underway for several years.

The Pilot Communities Program is operating in four cities:

Washington, D. C. begun in 1965, affecting about 500 teachers and reaching some 20,000 students.

Boston, where the present program was begun in 1967, involving 200 teachers.

Bridgeport, Conn., begun in 1968, with about 80 teachers directly involved.

Bruswick-Rockland, Maine, begun in 1968 with about 100 teachers involved.

In teacher training, the goals of the program are to develop a model for causing changes in teachers and the learning environment (and hence improve learning conditions for students), to implement this model into a self-perpetuating system, and to describe the parts of the model so that they can be transferred to other school systems.

The program has concentrated on elementary schools and has been chiefly concerned with in-school training of teachers, workshops for teachers, and logistical support (providing materials needed by the teachers in any new approach they are trying out).

The work with the 14 elementary schools of the Cardozo district, Washington, D. C., has been the prototype for other parts of the program. Two years ago a fifteen-member "innovation team" was formed as a result of a five-week summer staff development conference. Each teacher involved in the program gets five days of released time per year to attend workshops and other activities. The great strength of the approach is held to be that training on the problems of teachers is given at a time and place where it can most easily be adapted to the job. Information so gained is applied immediately and pragmatically for the benefit of students.

The foregoing will, it is hoped, lead to some significant changes in the role of teachers and in the teacher's perception of his role. Of prime importance is the shaping of a teacher's attitudes so that he realizes that education is a "human, interpersonal thing."

The Innovation Team is currently writing, documenting, and preparing to disseminate techniques it has learned for causing change in schools and for creating new learning environments. Some of these publications are being used in a training institute for teachers this summer.

The Washington project is believed by its leaders to be the only project in the country where white and black people have cooperated for five years. They attribute some of their success to the fact that EDC's role is only supportive.

The environment for the Boston Pilot Communities project differs from that in Washington. In general, the Boston area schools are considered resistant to social reform in the racial area. There is a shortage of black teachers -- in one school, for example, nearly all of the students are black and nearly all of the teachers are white -- and little is being done by the system to change things.

The aim of the Boston project is to identify teachers who want to do something and then to get them involved and persisting with changes in attitude and techniques, even in the face of adversity. The project leaders want to create or, if it already exists, sustain an attitude in teachers which will build credibility and trust between teachers and students. To this end, weekly workshops are held for teachers from several public schools and from three independent schools.

As in many projects studied for this report, measurement of success in the Pilot Communities Program is difficult. Ideally, one might think, student achievement should provide the answers. The Washington School of Psychiatry has this year studied the impact of the program by looking at student achievement data. Unfortunately, student mobility and poor recording procedures, among other things, put the accuracy of such measurement in doubt. Further complicating the picture is the fact that the goals of the program evolved over the years. As a result, neat comparisons are not possible between, for example, the tight traditional classroom and the new open classroom. Inevitably much of the data is in the form of observations of the classroom.

Reactions by both students and teachers to the techniques introduced to the schools are being collected in the School of Psychiatry report. Leaders of the project believe that the subjective judgment is generally favorable.

Two other projects are worth brief descriptions. They are the Social Studies Curriculum Program and the program of the Physical Sciences Group. The latter is derived from the Physical Science Study Committee, the oldest of EDC's projects and the one from which the laboratory has grown.

The social studies program is developing "Man, a Course of Study" (MACOS) which was launched by Jerome Bruner in 1965. This course, covering approximately one academic year, is given at the intermediate grade level and is intended to increase students' understanding of what it means to be human. The principal method of instruction is viewing of realistic films of contrasting cultures, followed by discussion. Teacher training in this program has evolved over three years from an approach in which all teachers were taught directly to one in which responsibility for training has been decentralized. Training now begins with a conference attended by eight three-man teams. Each team includes a professor of education at a teacher's college, an anthropologist, and an experienced teacher from a school district which will be served by the team. Each team from the conference goes back to its own area to hold five-week institutes to train twenty-five or thirty lead teachers in MACOS. Then, at his own school, each lead teacher from the institutes will train about ten other teachers to use the course, with the result that about two thousand teachers are trained to use the course materials.

In the Physical Science Group, in-service teacher-training materials have been developed and pre-service materials are being prepared. The courses have been designed to provide the subject matter strength and confidence lacking in most teachers but needed for presentation of the physical science program. Teacher training for these courses has involved training both teachers and workshop leaders. EDC has also assisted other agencies in setting up workshops and college extension courses for teachers who plan to use the courses. Two teacher-training films have been completed and another eight or ten are contemplated.

EDC has now turned its attention to the problems of pre-service training. Starting this fall, it will have available for pre-service training a course in high school physics and chemistry in which teaching techniques and subject matter instruction are combined. The laboratory is also trying to make early college courses fill the requirements for either physical sciences teaching or applied science. This makes it easier to recruit educators during the college years by enabling the person who starts out in applied science to shift to education without loss of credit.

Far West Laboratory for
  Educational Research and Development
1 Garden Circle, Hotel Claremont
Berkeley, California 94705

Mission

The Far West Laboratory for Educational Research and Development states its mission as "enhancing children's opportunity to learn by developing new educational products." The three types of products envisaged are:

- In-service and pre-service self-instructional training units to provide teachers with critical teaching skills.
- Research and development information systems and training programs to help schools modify their organizations and make decisions about adopting new educational developments.
- Pre-school and primary education programs to develop the intellectual ability and self-concept of young children.

Priority has been given to teacher training and the laboratory has, as a matter of policy, pressed forward with programs expected to yield early improvement in teacher skills. Foremost among its activities has been the development of self-instructional packages for elementary and secondary teachers. In these courses, the laboratory has tried to exploit the potential of new audio-visual media, particularly videotape and closed-circuit television.

Teacher Training

The laboratory's Teacher Education Program, selected as its primary program in March, 1967, consumes about 75 percent of its funds. The program has two major objectives:

- To develop instruction that can bring about major changes in a teacher's skills and classroom behavior.
- To develop a subsystem of teacher education that would train a teacher in all or most of the skills that appear to be critical to a teacher's effectiveness.

To date, most of the work in the program has been on what are called "minicourses." The minicourse, an extension of the Stanford Microteaching model, involves a three-step instructional sequence:

(1) The trainee sees a videotape of a lesson in which two or three teaching skills are described and demonstrated. This is followed by a videotape of a model teacher applying the particular skills in a short classroom lesson. During this videotape the trainee learns to discriminate between the skills.

(2) The trainee prepares a brief lesson using the demonstrated skills and then teaches a ten-minute lesson to four to eight students. The lesson is recorded on videotape and immediately upon completion the trainee, the only person to see his tape, evaluates his own performance.

(3) The trainee replans his lesson and reteaches it to another group of pupils. Again the lesson is videotaped and again the trainee evaluates his performance during replay of the tape.

Each minicourse consists of a self-contained package of the instructional and model films, handbooks, evaluation forms, orientation schedules, and daily activity schedules. The teacher spends about an hour a day for 15 days on each course. Minicourse 1 ("Effective Questioning Techniques in a Classroom Discussion") is now in use in a variety of in-service and pre-service training situations. Four other courses will be subjected to their third and final stage of testing this year. Two more courses are at the field testing stage of development, and two more are in the literature search stage.

The laboratory seeks cooperative relationships with other institutions for testing and developing courses. Stanford Research and Development Center is planning to assist in a research project on Minicourse 9, for example. Eighty-six school districts and twenty colleges and universities have held field tests or cooperated in research projects.

The Teacher Education Program expects to devote most of its time and money to minicourses over the next two or three years. In addition, it is hoped to develop two other models for changing teacher behavior in the next four or five years. The Teacher Education Program is also adapting its minicourses and other instructional models for use in pre-service and in-service training at colleges and teacher training institutions. Testing in a dozen colleges and universities of five of the minicourses is currently underway.

The laboratory has purposely set development ahead of research in its selection of the skills to be incorporated into minicourses. The skills are those considered basic enough and crucial enough for wide impact. The list was drawn up as the result of the experience of its staff and through a literature search. This method of establishing priorities is considered justified by the perceived need to make products available both quickly and in quantity. For example, an objective of Minicourse 1 (which will be commercially available next year) is to reduce the amount of teacher talk time and increase the amount of talking by students. There is no clearcut evidence on the optimum ratio of talk by students and teacher. Research does show that teachers talk approximately 75 percent of the time. It is intuitively appealing to suggest that if students are to gain more experience in using their knowledge in discussion, their share of talking needs to be considerably larger than it is. To obtain research evidence in an area such as this would, in the opinion of the laboratory staff, call for a 10:1 ratio of research to development, which is contrary to the aims of the laboratory.

The development strategy for minicourses and other instructional models is systematic. It is based upon an analysis of 12 stages and 27 steps which carry development through its final testing. The analysis shows the number of man-weeks needed for each step. Objectives are projected roughly in the initial stages and then refined during early steps of development. To provide evidence that it meets its objectives, the product is subjected to three stages of field testing and revision.

So far, most of the concern has been with specific changes in teacher behavior and with the attitudes of teachers completing the minicourses. The emphasis thus seems to be on making the minicourses interesting and relevant to the teacher, with little effort to this point to determine how the changed behavior of the teacher affects the student.

The main field test of Minicourse 1 with 48 teachers yielded significant differences on 10 of the 12 teaching behaviors. It also showed that teacher talk time was cut nearly in half. Four months later there was virtually no decrease in the teachers' use of the skills taught, making unnecessary a refresher course which was being developed.

In its search for other models for teaching classroom skills, the laboratory is currently developing a Classroom Simulation Model. This model is designed for kinds of behavior that are not directly under the control of the teacher and that are not frequent in the classroom. The first course being developed in this area will increase the teacher's skill in dealing with classroom discipline problems at the intermediate grade level.

A third instructional model was introduced into the Teacher Education Program this year following a feasibility project in the Communications Program. The purpose of this model, entitled Stimulation-Discussion-Action, is to improve the human relations climate between school personnel and students. In the model, four films that include confrontations between school personnel and students are used to simulate school personnel to identify such situations that need discussion and action. Other parts of the package include discussion trainer films and two handbooks.

The films on human relations confrontations mentioned above were part of a series of workshops conducted for about 300 teachers in metropolitan secondary schools in the San Francisco Bay area. The workshops were based on five half-hour telecasts broadcast by a local educational television station. The open-ended objective of the workshop was simply to promote awareness of attitudes and habits impairing communication between members of different racial groups, and to encourage change. The laboratory was responsible for research, production of prototype programs, and evaluation. It also trained discussion leaders. The evaluation was informal, consisting mainly of reports by observers and end-of-course critiques by participants. Overall, reaction was favorable, and participants' comments are being used as a basis for revisions. In addition, a self-contained course for discussion leaders and an administrator's manual are planned.

Mid-Continent Regional Educational Laboratory
104 East Independence Avenue
Kansas City, Missouri 64106

Mission

The mission of the Mid-Continent Regional Educational Laboratory is to improve instruction by developing in-service and pre-service training programs which stress inquiry and self-directed learning, initially including:

- Pre-service and in-service curriculum, field experience, and teaching experience for potential and current teachers in the inner city.
- Instructional processes and classroom arrangements to insure that teachers effectively foster inquiry development in students.

McREL devotes practically all of its efforts to the training of teachers. It has two major areas of interest, one of them quite different from anything being attempted elsewhere.

Teacher Training

The Cooperative Urban Teacher Education Program (CUTE) is aimed at drawing teachers into the crowded urban and ghetto schools and at reducing the high turnover of teachers in such schools. Some forty colleges and universities within the region are participating. About 100 student-teachers were involved in CUTE this school year (1968-69).

Although training is in progress in the program, the laboratory's purpose is not to train teachers but to develop a model of teacher training which can be replicated elsewhere. A CUTE training session, as currently devised, lasts sixteen weeks. Training teams have been set up in three locations, each team consisting of a sociologist, a psychiatrist or clinical psychologist, teacher educators, and teachers experienced in the work of the inner-city schools. Participants learn what it is like to work as a teacher in the inner city both from briefings by those with experience and at first-hand. In weekly sessions with the psychiatrist or psychologist, they learn about mental health and about themselves. They learn how to handle frustrating and even threatening situations that can occur in schools. In addition, the first eight weeks of training include extensive field trips to meet with groups such as the Salvation Army, Vista workers, and Black Panthers. They practice-teach,first, in simulated conditions in which their performance is videotaped, and then, in the second half of the training, they get actual teaching experience.

One goal of the project is to give teachers confidence that they can be effective in the inner city. It attempts to do this by developing a teacher with a better perception of himself and of his pupils' environment, problems, and attitudes. To date, there have been six CUTE training sessions (four at Kansas City, one at Wichita, and one at Oklahoma City). The first groups of trained teachers are now at work and a follow-up study is underway.

CUTE is intended to motivate teachers to work and stay working in the problem schools of urban areas. Thus the true measure of its success would be recruitment and turnover figures. It is too early to say whether CUTE is succeeding on this basis. There is an assumption that the teacher's increased sensitivity and appreciation of problems will lead to more effective teaching.

An extension of CUTE, The Urban Higher Education Program (UHEP), will train "master-teachers" with special qualifications for working in schools in the urban areas. This will include a graduate-level teacher education program which will lead to a Master's degree and identification as "master-teacher." Graduates of this program will function as supervisory teachers, not as administrators. The first year of this two-year program will include inner-city experience and "course work" at a cooperative university. The second year will include an internship.

The laboratory plans to further extend the CUTE program by providing in-service education during the first year of teaching experience for the new inner-city teacher. The inner-city teacher education effort at McREL will thus cover a pre-service undergraduate program, a first-year teacher in-service program, and a graduate program leading to a degree and designation as "master-teacher."

McREL's second major project is the Development of Inquiry Skills Program (DIS). Components of this program include the Inquiry Role Approach (IRA), Instructional Staff Development (ISD), and Improving Instruction through Inquiry (Triple "I").

The IRA component attempts to work with the interaction of three variables affecting inquiry development--intellectual task-coping, social interaction, and self image. Teachers are guided by the laboratory as they move students in high school biology from virtual dependence on the teacher for development of intellectual and social skills, to a relatively independent role of investigator and evaluator.

In the past year, twenty teachers from some sixteen schools and approximately 3,000 students have been involved in experimental groups for IRA. Data are being processed on the standardized test performance of these students and of a control group of 900 others. In addition, teachers' opinions have been collected and students have been asked to rank their teachers' skills.

The Instructional Staff Development component, now being developed, is intended to help teachers learn how to foster inquiry skills in pupils. It includes units on the meaning of inquiry, using interaction analysis to promote inquiry skills, using micro-teaching to develop teacher skills, specifying behavioral objectives for inquiry skills, promoting pupil-centered inquiry techniques, and promoting student-directed inquiry.

The Triple "I" (Improving Instruction through Inquiry) program focuses upon curriculum and the development of materials and procedures to promote inquiry skills among students and teachers. The approach is intended to be a comprehensive one which uses the techniques of systems analysis in the design, development, and test of instructional materials.

McREL looks forward to a day when it will bring together elements of all its programs through the mechanism of a Staff Development School. The planning of the Staff Development School will be done during a fifteen-month period which began last June, with the operation of the school to begin in September 1970.

Northwest Regional Educational Laboratory
400 Lindsay Building
710 Southwest Second Avenue
Portland, Oregon 97204

Mission

The Northwest Regional Educational Laboratory (NWREL) has the mission of developing and disseminating educational products which will help organizations, agencies and individuals to improve educational practice. Educational products are being developed for instructional systems designed to improve:

- Teaching competencies;
- Education for intercultural groups including innder city and Alaskan Indian and native groups;
- Instruction in small rural schools by means of self-instructional systems and guidance materials.

The improvement of teacher competency is a major goal of the laboratory and nearly half of its efforts are devoted to this end. Its activities include eleven projects concerned with improving teaching competencies. The laboratory is concerned with learning how to use what is known about learning, and it also considers it important to provide training "before we know all of the research answers." In part, this stems from a belief that getting an educational product used in the schools is an important and neglected aspect of development.

The laboratory makes a point of involving practitioners in development. Such involvement provides not only training in the development of instructional systems, but helps to ensure a high degree of commitment to use them by people in the field.

Teacher Training

The laboratory's teacher education comes under the heading of Program 100. The intent is to give teachers "more understanding of those processes which help pupils." The processes are five, and each covers one to four project areas, as follows:

- I. Promote pupil initiated and self-directed learning
  - A. Cross-age and peer help (Project 112)
- II. Improve interaction between teachers and pupils
  - A. Inquiry development (121)
  - B. Development of higher level thinking abilities (122)
  - C. Analysis of pupil-teacher interaction (123)
  - D. Questioning strategies leading to productive thinking (124)
- III. Increase the objectivity of classroom analysis and the effectiveness of interpersonal relationships
  - A. Systematic and objective analysis of instruction (131)
  - B. Research using the problem-solving process (132)
  - C. Systems technology (133)
- IV. Maximize the effectiveness of interpersonal relationships
  - A. Interpersonal communications (141)
  - B. Interpersonal decision making (142)
- V. Provide support for continuous learning of school personnel
  - A. Preparing education training consultants (515)

Program 100 currently requires the equivalent of the services of eight full-time staff personnel. The four projects having to do with pupil-teacher interaction (Projects 121, 122, 123, and 124) consume about 60 percent of the program's resources. These four projects are being merged into a single project because experience has shown considerable overlap. A further 20 percent of resources is devoted to the problem-solving and systems technology projects (132 and 133). The remaining projects are classified as "slow-active" with the exception of the analysis of instruction (131) and preparing education training consultants (151) which are both designated "hold."

NWREL places stress on instructional systems that will produce teacher behaviors related to production of desired behaviors by learners. It is one of the laboratories which tries to evaluate a teacher's changed competence after training not only on the basis of how much the teacher has changed, but on the basis of how students have changed as the result of the teacher's efforts.

The teacher education projects furthest along are the workshops for analysis of instruction (131) and development of student skill in inquiry (121).

The former, a 100-hour, four-week program, is designed to improve a teacher's skills in the systematic and objective analysis of classroom instruction. As currently designed, the workshop tries to make teachers aware of what are considered to be important aspects of instruction -- effective communication by both teacher and student, skills in establishing interpersonal relationships, increased interdependence in the classroom group -- and gives them practice in observing and analyzing the behavior of other teachers. After instruction, teachers observe the work of a master (or demonstration) teacher and record his performance for later analysis. Since the course was designed for use by supervisors and administrators, rather than teachers, it does not include practice teaching and analysis of that teaching.

The workshop on student inquiry sets out to make the teacher more skillful in techniques that increase a student's capabilities in acquiring, processing, and using new knowledge. Its goals are to train teachers to:

1. Tune in to student feelings, attitudes, and perceptions;
2. Allow inquiry to happen;
3. Facilitate the student's self-directed growth.

In developing the inquiry materials, four criteria of developmental success have been identified. Of these, only the first has been implemented. The criteria are:

1. Clarity of materials (determined by having an editor review the materials and by seeking reactions from some teachers).
2. Relevance (determined by finding out how much of what is presented is learned by the teacher. A test is being developed.)
3. Enactment. This has to do with how much of what is learned is actually put to use by the teacher. It is regarded as a major criterion of success. At present, no such measure exists.
4. Student performance. This is the ultimate criterion -- whether desirable changes have taken place in students as a result of the teacher's new skills. No action is being taken on this criterion as yet.

Regional Education Laboratory for
    The Carolinas and Virginia
Mutual Plaza
Durham, North Carolina 27701

Mission

The mission of the Regional Education Laboratory for the Carolinas and Virginia (RELCV) is to help educational institutions, particularly those in higher education, to improve themselves. To this end, it is called upon to develop a computer-assisted planning and decision-making system for institutional change, supported by a training program for key decision-makers in two- and four-year colleges. The system would include training for the newly defined role of educational development officers who serve as institutional researchers and catalysts for change. The mission further calls for educational improvement in both two- and four-year colleges through development of programs which contain precise measures of student performance and which permit students to learn at their own individual rates. At yet another level, it is charged with developing models for installing and diffusing new instructional systems for elementary and secondary schools.

Teacher Training

RELCV activities fall into three categories, the four-year senior college level, the junior and community college level, and the elementary-secondary level. While there is little apparent overlap among these categories at present, the nature of the problems being attacked is such that the products and findings at each level are expected to be useful at the other two levels.

Until now, the teacher training activities at the elementary-secondary level has been concerned with the skills needed to implement an individualized instructional system in elementary mathematics, having started with the installation of IPI (mathematics). At the junior and community college level, the laboratory began work at the end of 1968 on a program to train faculty members to use the systems approach to instruction and to provide administrative support for the in-service training of faculty. The first four workshops for faculty members of junior and community colleges were completed in August, 1969. Now being planned is a model experimental school which will service seven (or more) teacher training colleges by providing both preservice and in-service training of teachers and also serving as a model for teacher training. At the senior college level, the instructional system to be introduced and tested will be similar to the system being used in the junior and community colleges, but will be adapted and tested in another kind of environment.

The IPI elementary mathematics curriculum, developed initially by the Pittsburgh R&D Center and now being further developed by Research for Better Schools, Philadelphia, Pa., is designed to give a student freedom to work at his own pace and in an individually prescribed course for developing mastery both of the subject matter and of more general problem-solving skills. (The IPI materials are more completely described in the section on Research for Better Schools.) At RELCV, the staff has been adapting the IPI materials to its regional needs, attempting to reduce costs while increasing effectiveness with regional students. Of particular concern to RELCV is the fact that present materials provide only one approach to learning. Consequently, the laboratory is adapting the materials to give the student choices from among five styles of learning: concrete, perceptual, abstract, teacher-directed, and pupil-directed. Students are given increasing responsibility for keeping track of their own progress and for the selection of materials (style of learning) which most effectively meet their individual needs.

The adaptation and installation of individualized instructional materials consumes less than one-tenth of the laboratory's budget. Approximately 30 percent of this effort is in preparing teachers to use the adapted system. The system tried to change the teacher's role from that of a one-way lecturer to that of a person who helps the student achieve specified behavioral objectives. At this time, there is no formal training package for this purpose (although one is planned) and the program director prefers not to rely on manuals or "theory courses" as ways of training teachers. The stance of the program has been that teachers learn better by "doing" rather than by learning generalizations and that the role of the laboratory should be to provide help where the principals and teachers ask for it. Thus the training procedure has been for the trainee-teacher first to attend a two-day workshop presided over by the school's principal. This is followed by observations of other teachers, followed in turn by about two days with another teacher, actually doing the things that he will have to do in his own class. The laboratory is experimenting with a policy of paying a modest honorarium to the teacher who helps to train others; laboratory staff members feel that this may be a promising technique.

At a different level, the laboratory has also stressed the importance of receptivity by the school (principal and supervisors) to the training of teachers in this program. Schools are given as much control as possible over the training. In the five schools currently involved, the principals have responsibility for training their own teachers, with the laboratory staff providing monitoring and liaison.

Teacher training for the new system is enhanced by providing instructional aids, wall charts, and checklists, rather than having teachers memorize rules and procedures. The training "sneaks up" on subject matter competency simply by exposing teachers to the subject matter as part of their regular daily preparation, rather than by holding formal courses on unfamiliar subject matter concepts and methods.

In adapting the commercially available IPI mathematics materials, the laboratory places great stress on instant feedback, both to the teacher and to the student. The feedback to students is facilitated by immediate self-scoring by the students themselves. Each batch of feedback data is incorporated into the instructional process in successive cycles, thus aiding both the teacher and students in selecting alternative approaches to the mastery of specific behavioral objectives. As an example of the emphasis on feedback, the laboratory gives participating principals and teachers "collect call" privileges to the laboratory at all times.

Data on student performance using the adapted materials are currently being processed and therefore cannot be reported at this time. The subjective assessment of teacher reaction as quoted by the program director is that "95 percent of the teachers participating feel that the system helps students learn mathematics better." The staff of the laboratory does see the need for particular modifications in both the system and in the materials.

In the College Teacher Education program, work has been concentrated on the preparation of 28 manuals and other materials for use at four summer workshops and in-service training during the year following. All colleges and teachers participating in the program are volunteers. In addition, the Junior and Community College Division is introducing in four graduate schools of education in the region a course for teachers on the systems approach to instruction.

Research for Better Schools
1700 Market Street, Suite 1700
Philadelphia, Pennsylvania 19103

Mission

The restructuring of elementary education is the province of Research for Better Schools (RBS). Its statement of mission calls for it to individualize and humanize the curriculum, initially by developing:

- Strategies for implementing the so-called Individually Prescribed Instruction system, including not only the preparation of materials but the training of school personnel, in cooperation with schools across the nation.
- Specifications for an instructional program which is concerned not only with intellectual skills but with the social and emotional skills of children.
- Training for school administrators to facilitate the adoption of new programs.

RBS has three major programs, each corresponding to an aspect of the mission. In order, they are: Individualized Learning, Humanizing Learning, and Administering for Change.

Teacher Training

In terms of budget, the Individualized Learning Program represents 75 percent of the RBS operation. This is the only RBS program in which there is teacher training at present. Within the program only the Individually Prescribed Instruction (IPI) project now involves teacher training, although the program's other two components -- automated learning management and computer assisted instruction -- are expected to do so later.

The Individually Prescribed Instruction project combines both materials and procedures, and permits each student to work at his own pace and with a large measure of control over the direction he takes in studying an area of subject matter. The student's materials are designed to carry him to mastery of the subject matter and also to develop his problem-solving skills. Six elements distinguish IPI from conventional elementary school procedures: Detailed objectives, organization of methods and materials to attain these objectives, assessment of the student's present competence, individual daily evaluation and guidance of each student, frequent monitoring of student performance to inform both pupil and teacher of progress, and continual evaluation and strengthening of the curriculum and procedures.

IPI materials now include mathematics, reading, spelling, writing, and science. The mathematics materials in the RBS or amended form, have been used by several other laboratories.

The laboratory has divided its IPI work into five categories with about five staff members working on each:

1. Demonstration schools;
2. Development of materials;
3. Training of teachers, administrators, and aides;
4. Implementation in pilot schools;
5. Appraisal of student achievement and of the effort of teachers and others engaged in administering the materials.

There are six demonstration schools covering a broad spectrum of socio-economic conditions. In these schools, the laboratory bears about 90 percent of the cost of IPI development (about $100,000 per year for each school) including teacher training.

When satisfied by experience in demonstration schools that an IPI curriculum area is ready for wider implementation, RBS introduces it into schools which have volunteered to take part in pilot studies. The cost of pilot school operation is borne almost entirely by the schools themselves with RBS supporting only monitors and data collection. In the past school year, almost 100 pilot schools and 50,000 students have been participating all over the country.

The IPI mathematics curriculum in particular has been extensively revised since its introduction in 1966. It is expected that it will be made available in 1972 by a commercial company.

Training consists mainly of in-service training in IPI for personnel in the demonstration and pilot schools. To date, most training has been in the mathematics curriculum -- the largest of the IPI efforts -- at the primary and elementary levels. There have been two major changes in training methods since IPI began in 1966:

1. The emphasis has switched from training teachers and aides to training administrators to train these personnel;
2. The laboratory has turned from group instruction in institutes to individualized, self-instructional training programs.

The target population for in-service training are administrators, teachers, and teacher aides. Perhaps the main distinguishing feature of RBS training strategy is the selection of the school administrator as the intermediary for training. These administrators will take over entirely the training of IPI teachers. The administrators' training covers not only the five subject matter areas of IPI, but also includes a new area, "innovation analysis." This last, which is training in solving the problems in the classroom and in administration during introduction and use of IPI, is the outgrowth of the laboratory's experience in introducing IPI to demonstration and pilot schools.

This year, experienced administrators spent two days at RBS for updating. These administrators, from fourteen sites across the country, returned to their schools to present one to two weeks of training for new administrators who, in turn, trained their own teachers. The training uses a published set of five individualized, largely self-instructional manuals, which include both pre-and post-tests for the trainee teacher. Following the initial training, weekly training sessions of about one hour are held for the teachers.

Classroom aides are important in the use of the IPI system. Currently such aides are mostly concerned with correction of tests, although RBS would like to broaden their assignment. Aides have helped to develop their own training manual for IPI. It familiarizes them with the materials and provides practice in an aide's duties. Training materials for the aides include a sound film strip.

Now in development is continuation training for teachers, administrators, and aides already in IPI. The aim is to provide continuation materials which can be used by participants at their own discretion to maintain and update their slides in using and supporting IPI.

In addition to the demonstration and pilot school operations and their associated training the IPI group has some other, smaller teacher education activities: (a) in collaboration with the Far West Laboratory it has developed a course on error analysis which will be tried out in demonstration schools this year, (b) it has developed and introduced at a teachers college in Pennsylvania a course for junior and teachers colleges. This course on teaching IPI mathematics is intended to be used just before an individual begins student teaching. (Graduates who took the pre-service course are reported to be in demand and the laboratory has received several dozen requests for names of graduates of this course.)

The chief gauges of success in training educators to use IPI are a questionnaire completed by administrators participating in training, various measures of student performance and points of view, the reports of monitoring and resource teams which visit schools periodically, and a degree of implementation study. Administrators and teachers reveal generally favorable attitudes towards IPI and the training given. The Iowa Test of Basic Skills showed no difference between IPI and control students, except in juvenile reform and ghetto schools where IPI exceeded controls. On criterion referenced placement tests, however, the IPI schools consistently show a significant difference over control schools. Analysis of dispersion of achievement scores within a school and grade show greater dispersion in IPI schools than in controls; this, RBS staff believes, implies successful individualization. The reports by monitors have been used to improve the performance of individual teachers and to refine instructional materials and methods.

In addition to the foregoing, the reactions of thousands of visitors to IPI schools have been sought, both at the beginning and at the end of their visits. Case studies at the six demonstration schools included open-ended discussions with 18 students in each school. The 108 students -- six low-achieving, six middle, and six high-achieving -- favored IPI on the whole. Their adverse opinions tended to focus on inefficiencies in procedures (having to wait for materials, for example) rather than on the fundamental ideas of IPI. An informal but dramatic example of socially beneficial effects of IPI comes from a demonstration school serving a ghetto area. Here the number of police contacts with the schools has dropped from 127 the first year to 27 the second year and to 1 in the past year. The superintendent of the school system commented further that the "reduction in window breakage alone is enough to pay for IPI."

In introducing IPI in demonstration schools, the laboratory has encountered teacher opposition of the "these kinds are too dumb to learn anything anyway" kind. It is reported, however, that once IPI has been in for a while the same teachers often have become enthusiastic. As a further comment on the difficulties of innovation, the laboratory staff cites experience when it sought to introduce IPI through pre-service training in teacher colleges. Early in the history of IPI, RBS invited all deans of teacher colleges in the region to a conference. The deans rejected the IPI approach outright saying, "maybe later." Largely because of this, RBS decided on its present policy of in-service training through school administrators.

Southeastern Education Laboratory
3450 International Boulevard
Atlanta, Georgia 30354

Mission

The Southeastern Education Laboratory's mission is to improve the education offered to children in the Southeast by developing:

- Instruction in communication skills, designed to overcome the educational problems which arise from nonstandard speech patterns.
- Curriculum materials in interpersonal relations for students, teachers, and parents to facilitate learning and mental health.

The work of SEL is a good example of the way in which a laboratory in meeting the prime needs of its region has developed products which ultimately could be used across the nation. The region has a larger percentage of isolated rural schools than any other region, leading to problems which have received national attention. The laboratory set out to improve the opportunities for disadvantaged children, mostly black, to enter the mainstream of education, putting its initial emphasis on pre-school and kindergarten through sixth grade.

The laboratory employs a staff of about 40, approximately half of them professionals. In brief, the three major activities in which the laboratory is engaged are:

1. Language/Communication Skills

   This program in language skills has grown out of the concern over the problems suffered by disadvantaged children. It had its start in the period when the role of laboratories was dissemination. A network of 24 schools has cooperated with SEL in identifying needs and testing materials. Under development (currently being tested) are what are called "multisensory language development materials," for language enrichment using both the school and home vocabularies.

2. Interpersonal Relations

Simply stated, the concern here is to produce a "sensitivity" or "empathy" course to help integrate black and white students get along. Some preliminary drafts of materials have been prepared.

3. Rural Isolated Schools

The major effort here is in mobile classrooms providing preschool and kindergarten experiences in areas where there are no nursery or kindergarten classes. The "Readimobiles," equipped with books, play materials, and audiovisual devices, spend two hours a week in each location on their circuits. The Readimobile program is not so much a local help project as a laboratory for developing approaches and materials that could be used nationwide. SEL is primarily interested in using what is already known to develop new products that work and in distributing the products or plans for use by others.

Teacher Training

Although there is inevitably some teacher training involved in projects concerned with communication and interpersonal relations in schools, teacher training is at present a minor activity at SEL, accounting for less than five percent of its activities. This percentage will probably increase as materials reach the field test stage.

As a component of the language program a linguistic kit is being prepared as a handbook to help teachers diagnose reading problems. Little has been done as yet to formally train teachers to use the language materials.

A handbook on classroom video-taping has been developed for use by teachers in self-analysis of teaching techniques and the analysis of student behavior.

As part of the Readimobile program a handbook is being prepared describing how to set up, equip, and use a Readimobile.

In the rural school program, a "Comprehensive Planning Guide," is being prepared for administrators to help them evaluate and improve their school systems.

Southwest Educational Development Laboratory
800 Brazos Street
Austin, Texas 78701

Mission

The Southwest Educational Development Laboratory (SEDL) is developing four learning systems to fill identified deficiencies in instructional programs for children who are economically disadvantaged and culturally different. In the Southwest, this target population includes large numbers of Mexican American (urban and migrant), Negro American, and French American children.

The four Laboratory learning systems are:

- Bilingual Education, which develops language skills in both English and the home language while providing instruction in substantive areas (science, social studies, mathematics, reading, composition) in both English and the home language.
- Mathematics Education, which develops mathematical skills for elementary and junior high disadvantaged pupils.
- Multicultural Social Education, which is designed to provide a comprehensive program of social education for children from economically deprived and culturally different backgrounds.
- Early Childhood Education, which is designed to emphasize communications and psycho-social development for children ages 2-5.

For this work, the laboratory employs 210 persons, of whom about half are professionals. Approximately 50 percent of Laboratory activities are funded by the U. S. Office of Education. The focus of the laboratory is on intercultural education -- education that responds to the problems created by the interaction of cultures.

Regional in its initial design, with concentration in Texas and Louisiana, the laboratory continues to respond to educational needs that are unique to the region and compatible with national priorities. The Bilingual Program has been considered so successful that it is now being tested in Harlem and in the Bronx Puerto-Rican sections of New York City. It has also been adopted elsewhere.

The laboratory is striving to go beyond the equalizing of educational opportunity to the equalizing of educational results. It has taken a view, similar to that of SWCEL, that the current education system uses language, materials, and teaching methods and attitudes that have been successful with advantaged children, but which neglects the needs of the economically disadvantaged, unmotivated, and culturally different children. As a result, these latter children have been expected to adapt to an educational system irrelevant to their past experiences and their future needs. The laboratory is developing new curriculum and instructional techniques for the needs of these children.

Teacher Training

Since the techniques and materials are new, teacher training is necessarily an integral part of each of the laboratory's learning systems. Teacher training occupies about one-fifth of the laboratory's total effort and is concerned primarily with the use of the laboratory's materials. In addition to preparing materials for teachers, the laboratory has staff members who work on a continuing basis with pilot test teachers to refine instructional materials and techniques.

The Bilingual Education learning system of the laboratory has developed teaching procedures which are being adapted, as feasible, for the other programs of the laboratory. Each learning system calls for continuous and extensive activity by the pupil and interaction with the teacher. Bilingual Education was designed to teach the Spanish-speaking child in areas such as science, social studies, mathematics, and reading in his native language at the same time as he is learning English as a second language. (Modified versions are being developed for use in Louisiana in French/English and in Negro ghetto schools.) Now in its fifth year, the laboratory's Bilingual Education learning system was begun in San Antonio in 1964 as a research project of The University of Texas. This fall, 12,000 pupils throughout the nation will be using the materials. This summer, 600 teachers, 300 teacher aides, and 100 supervisor-coordinators participated in training programs in how to use the materials. Early in the summer, 25 supervisor-coordinators attended a three-week Leadership Training Conference held by the laboratory. They returned to their own districts to conduct workshops for teachers and to supervise follow-up activities.

In addition, the laboratory has developed an individualized, self-instructional teacher training sequence. Training includes video-taping and critique of a teacher's application of the techniques learned. A teacher learns to use a series of codes, similar to those in interaction analysis, with which to identify the behaviors of students, both collectively and individually, and of a teacher. He begins by observing films of model teachers, using the codes to identify examples of procedures involving responses by the whole group, sub-groups, and individuals. When he has practiced applying the procedures, his own teaching performance is video-taped.

Using the same codes and tally forms, he analyzes his own teaching by viewing the video-tapes, studying how the students have performed, and his reactions to their performance. From this, a profile is developed from which the teacher can observe his own strengths, weaknesses, and progress.

Teacher activities included are modeling (highly prompted imitation), drill management (calling on the group, sub-groups, and individuals), cueing (moving from modeling to guided free expression), verbal rewards, pupil-teacher talk patterns, and the problems of disengagement (the student who turns off) and disruption (the turned-off student who bothers other students), together with the correct reactions of the teacher to desirable and undesirable responses. Programmed texts used in the workshops teach the teachers to code classroom events as well as their own students' responses in these various categories.

The codes were developed by analysis of the behavior of teachers and students in various classes of interaction. Testing to date has indicated that the codes are apparently accurate, parsimonious, and effective.

SEDL's Mathematics Education learning system also has a major staff development component. Detailed books of procedures have been prepared for teachers paralleling the individual student workbooks for each grade level (now six). In addition, a program is being developed to train teachers to adapt state-adopted mathematics materials to meet the special needs of their students. Included are techniques for individually diagnosing the pupils' current mathematics competence, and for explaining lessons and concepts to disadvantaged children. At all grade levels, the mathematics program is intended to be activity oriented and pupil dominated. The student, not the teacher, is the center of the lesson. Thirty-five teachers and 1,200 pupils in Texas and Louisiana are involved in the program this fall.

The laboratory, through its Early Childhood education learning system, is developing cooperative programs in both Arkansas and Louisiana for teachers of young children. Both of these proposed programs include pre-service and in-service teacher training.

The Multicultural Social Education learning system "emphasizes understanding rather than the rote learning of facts and dates." Pilot test teachers participate in workshops to discuss the techniques to be used. Pilot test site coordinators from each of the three Education Service Centers working with the laboratory in testing the materials are also aiding in staff development.

Southwest Regional Laboratory for Educational Research and Development
11300 LaCienega Boulevard
Inglewood, California 90304

Mission

The Southwest Regional Laboratory's mission is to change the nature of conventional instruction to performance-referenced, computer-managed, and learner-controlled bases, and to develop a validated, replicable technology of instruction, initially through the development of:

- Comprehensive computer-managed kindergarten and primary curriculum including communications and problem solving skills and the humanities.
- Administrative planning system, utilizing computer technology and simulation to assist school administrators in decision making on staff, curriculum, facilities and instructional procedures.

The goal of SWRL is demonstrated improvement of school practice. The anticipated outcomes of the program are products (organized methods and materials) which will reliably attain the specified educational objectives, and technology (the systematic procedures) for the reliable and efficient production of further products. The point of view taken by the laboratory is that current technology for educational development is primitive. As a step toward identifying the technology, the laboratory is first developing products which can be shown to achieve their desired function.

Response from the region has identified the areas of greatest need as reading and problem-solving skills. The laboratory has concentrated on a reading program intended to work on children of all socio-economic levels and covering reading skills from prerequisite language skills through fourth grade. To date, work has been concentrated on the kindergarten level, but development is now moving into subsequent years. Some 2,500 children tried out materials last year, 600 the year before. Although the laboratory is responding to the needs identified by its region, the feeling is that it is also serving a national role because the problems of the region closely resemble those of other parts of the nation.

Essential to all the laboratory's effort is evaluation to ensure that any product fulfills its intended function. The laboratory emphasizes attainment of criteria to a degree not always apparent in the activities of other educational development. The broad picture of the criteria used can be seen from this list of criterion questions lifted from a SWRL document:

- What observable outcomes are anticipated?
- What procedures are available to measure the accomplishment of the outcomes?
- What materials are involved?
- What initial performance must the learner exhibit?
- What are the teacher's responsibilities?
- What evidence is available that the product has yielded dependable results?
- What are the time requirements?
- What direct and indirect costs are associated with the product?
- What is the relationship between the utility and the reliability of effect and the direct and indirect costs associated with the product?

Teacher Training

The laboratory is divided into four divisions, three concerned with products and one with providing resources. The product divisions are: Product

Design, Product Development, and Product Integration. Since the focus of the laboratory is on development of instructional products, its only teacher training is that required to make products work when used in a school. The Product Integration Division has the responsibility for doing what is needed to get, and to keep, a product working. This includes any training for teachers, supervisors, parents, or anyone else concerned in implementing the product.

Product Integration employs about one quarter of the laboratory's budget and its 150 personnel. Teacher training currently calls for less than five percent of the laboratory's total effort. The remainder of the division's resources are used in developing systems that might provide other ways than teachers to manage instruction, including computer-based systems, and in identifying, collecting, and analyzing data.

A specific cycle of development has been established for teacher training. It includes at least two try-outs of materials with a target population of teachers. In general, the procedure is for the Product Integration Division to ascertain from Product Development what the teacher is required to do in using the materials. Product Integration then devises materials such as checklists and manuals for teaching the necessary skills to teachers. A monitoring system to ensure that teachers continue to do appropriate things is also part of the system. (At present, a monitor is usually a member of the school district staff.) Training materials are also prepared for the monitor. To this point, the feedback from monitors has been a summary of what teachers did. This has now been made more rigorous, however, and starting this year monitors will gather information by which the laboratory can begin to determine if the teacher's new or changed behavior leads to desired changes in students.

At present, there is only one teacher training component, that for the first-year communications skills program (the reading program). The materials developed for teachers include a manual and a list of procedures shown by experience to maximize children's learning. Teachers attend an eight-hour workshop, run by SWRL, in which they learn about the materials and the procedures to be followed. SWRL plans to train others to run the workshop and these people, in turn, will teach personnel at the district level. It will then be the responsibility of the school district to put on workshops for teachers.

The mechanism for evaluation exists. By fall, the laboratory will have some 600,000 responses from some 3,000 students in addition to the monitors' log reports from which to develop changes in the program itself or in teacher training.

Southwestern Cooperative Educational Laboratory
117 Richmond Drive, N. E.
Albuquerque, New Mexico 87106

Mission

The mission of the Southwestern Cooperative Educational Laboratory is to improve the primary education of Spanish-, Indian-, and Negro-American children, initially through designing, testing, or developing:

- A pre-school program to improve the acquisition of English oral language.
- A primary grade program to improve English oral language.
- A program to facilitate the transition from oral language to reading.

The laboratory is confining its efforts to the education of those Spanish-American, Indian, and Negro children of the region, who, burdened by poverty and prejudice, do not have the perceptual and learning backgrounds of children in the cultural mainstream.

The goal is to increase the reading and speaking skills of such students so that by the end of the third year in school they will equal those elsewhere in the nation. Thereby, the laboratory hopes to give the child who does not speak English a chance to survive in the face of major forces which discriminate against his success in school -- the law in some states which says that instruction must be done in English, the inability of most teachers to use a language other than English, the ignoring by most teacher education agencies of the needs of non-English speakers, and the lack of curricular materials for non-English-speaking students.

The laboratory's intent, says its director, is to developed tested instruction. (He would prefer to leave to colleges and universities the installation and implementation of this instruction.) More than 80 persons are employed by the laboratory, about half of them supported by the Office of Education.

Teacher Training

Teacher training at the laboratory is centered on the Oral Language Program (OLP) developed at UCLA and modified to the needs of the region. Essentially, it teaches English as a second language. Teachers are trained to:

1. Teach the Oral Language Program and to teach other teachers how to use it;
2. Understand the Spanish, Indian, and Negro cultures and the psychological and sociological problems of the student and adult minorities speaking little or no English;
3. Implementing contingency management strategies in the classroom. (At present, they learn how to implement group reward when the entire class exhibits some form of desired behavior.)

Teacher training is done primarily through a one- or two-week workshop. Typically, a teacher in a workshop would:

1. See a videotape demonstrating each of the four reinforcement behaviors.
2. During pre-lessons, be videotaped with a few students, primarily for the "cosmetic effect." (This gives the teacher an opportunity to see herself on videotape and a chance to meet the students, as well as accustoming the students to the video-tapings.)
3. See a film about the oral language program.
4. Receive live and videotape instruction on the use of the appraisal sheets.
5. Participate in a lecture-roleplaying session to practice identifying behaviors and their appraisal.

6. Roleplay with another teacher the lesson they will teach. (These are the pre-designed lessons of the OLP. The teacher practices each of the four aspects of the reinforcement behaviors.)

7. Conduct micro-teaching sessions which are video-taped for analysis.

These micro-teaching sessions are intensive. After the teacher has spent about 15 minutes teaching four children, the session is immediately played back and critiqued by a supervisor. Then, after a five-minute break, the teacher reteaches the same concept to another group of four children. Again, a conference with the supervisor follows immediately.

After the teacher has left the workshop and returned to his own classroom, a consultant observes him for 20 minutes each two weeks and provides feedback on how well the teacher is following instructions in teaching the Oral Language Program. In addition, there is an in-service meeting of up to two hours every two weeks, during which there is interaction between teachers and feedback from the consultant.

The field consultants are hired at each of the sites where the OLP is taught. They receive four days of training at Albuquerque. As a measure of the efficiency of this training, the laboratory reports that at the end of training there is an inter-rater reliability of .85, which increases after further practice to .91.

No interaction analysis is being used at the moment; the consultant tallies the number of times a teacher or student engages in a variety of behaviors. These are indicators of the degree of student participation and of the teacher's style of class management. The consultant also fills out a short questionnaire with his subjective evaluation of the lesson.

In evaluating whether it has succeeded in training teachers for the oral language program, SWCEL emphasizes the collection of data on student performance. Last year, 120 teachers were trained, and the laboratory has data on performance in 120 classes. By the Michael Test of Oral English Proficiency, about 3,000 students are speaking better than they would be without OLP. Vocabulary, pronunciation, grammar, and the structure of the students' speech are more advanced than in children who have not had the program. The researchers do not know yet if this performance is good enough to reach their criterion, but they feel that these students are more encouraged about school and that many now want to come to school who previously did not, an important change. They believe, too, that this must also affect the teacher. When he sees students succeeding, he begins to change his image of their potential. As research shows, the changed image can be self-fulfilling -- when children are treated as potential failures, they tend to fail; when a teacher expects them to succeed and treats them accordingly, they tend to move in a positive direction.

All teacher training by this laboratory is done at a workshop. No attempt has been made to create self-contained, teacher training packages of the kind given priority by a few other laboratories. Given the laboratory's emphasis on changing teacher education only in response to student performance data -- and currently it is analyzing a mass of data from some 3,000 students -- such packages may, in fact, be premature.

Upper Midwest Regional Educational Laboratory
1640 East 78 Street
Minneapolis, Minnesota 55423

Mission

Increasing the effectiveness of teachers is the mission of the Upper Midwest Regional Educational Laboratory (UMREL). Classroom management, individualizing the curriculum, and redesigning the learning environment -- not just the effect of the classroom teacher, but of the administration and even the policy-makers -- are all identified in the statement of mission as areas of concern.

Teacher Training

The emphasis in UMREL activities is somewhat different from that in other Laboratories concerned with teachers. The broad areas of interest in teacher education are familiar -- the preparation of teachers to work with new techniques, new curricula, and new materials. UMREL takes the view, however, that many decisions about the changes needed in teacher behavior may be premature. Most educators, they feel, have pursued a strategy of arbitrarily selecting desired changes in teacher behavior and then, after experimentation to develop means for bringing about the changes, have implemented these changes in the classroom. UMREL, on the other hand, has based its policy on the position that the ultimate objective of education is to bring about changes in student behavior. Thus it begins its cycle by establishing classes in which student behavior is successfully changed to meet specified standards. Then in this relatively stable environment, it is studying the total learning ecology in which these changes occur -- the teacher, administrators, policy-makers, classroom organization, etc. -- to see which variables may be related to improving student performance. Priority has been given to setting up what the laboratory calls "behaviorally engineered classrooms." The laboratory is now investigating how changes in specific components of the environment, including teacher behavior, relate to changes in student behavior.

To date, the laboratory has developed four such classrooms. Two are in the inner city (one first grade and one third grade) and two are fourth grade classes of Indian students. This fall, the laboratory will begin operation of a completely behaviorally engineered parochial elementary school in the Minneapolis core city. In addition, two more classrooms are to be added at the original inner city site, and five more classrooms will be started on the Indian reservation.

In the engineered classrooms the methods used are similar to those employed by other institutions, notably the Southwestern Cooperative Educational Laboratory, Albuquerque, New Mexico. Teachers use a variety of reinforcing activities to promote learning and desirable activity among the students. These reinforcers include play with games or pet animals, and, more recently, play with junkshop items such as old typewriters and clocks. Following the principles of contingency management, the researchers watch to see which reinforcing activities are most used by each student. After the student successfully completes an assigned academic task -- for example, a sheet of arithmetic problems or a set of questions on reading material -- he goes to a separate part of the classroom where he is presented a "menu" of the various reinforcing activities available to him. He chooses a reinforcing activity, engages in it for a specified period of time, and then returns to his desk to work on another assigned task, beginning the cycle again.

UMREL has been using demonstration classes to train teachers how to operate these contingency-managed classrooms. In connection with a nine-hour training package, they have developed a training manual for teachers. As a result of experience, they have developed a changed strategy and a new teaching package which will be about fifty percent longer than the old one. The extension of time became necessary when it was found that in practice, the behavioral repertory of a practicing teacher includes elements which get in the way of learning the contingency techniques, and that these unwanted elements must first be extinguished before training can truly start. The same system is used in the two Indian classes as in the inner city classes, although with some difference in curriculum. The teachers in the Indian classes are experienced but do not have bachelors degrees. Anticipated difficulties in retraining them did not, in fact, materialize, and these teachers are considered an important factor in the success of the program with the children. One problem encountered through a comparison of the two populations is that teachers' new roles must be spelled out much more explicitly than is conventionally done.

How well are these new techniques working? There is little objective information at this point. The attitudes and testimonials of participating teachers are favorable. A score or more of local educators have asked to have the system introduced into their schools. (The laboratory has not tried to gain acceptance among local schools and in fact wants to keep the development limited until it is ready for controlled expansion.)

Some evidence of student performance has been accumulated. Individual records of reading performance by twenty-two students in a first grade inner-city class show increasing rates of progress for all students over a two-month period as compared with a previous three months of conventional instruction. Conventional reading materials were used throughout. In the areas of handwriting and mathematics there is little data. Standardized testing did not work with the inner city students. While researchers feel that the overall approach is working well, they are having trouble with the current mathematics curriculum and materials and plan to replace some of the materials. Researchers say that deviant behavior over a two-month period has decreased in proportion to the increase in constructive learning behaviors. They have videotapes showing how, after two months of behavioral engineering, irrelevant activity by students assigned individual work decreased to a point where the students are working quite industriously.

The laboratory is involved in preparing some curriculum materials. Kits are being prepared for English teachers to bring them up-to-date on new curriculum materials and to help them understand the rationale and uses for the materials. The first such kit has been tested, revised, and retested. No evidence other than general teacher responses is currently available about the effectiveness of Kit 1. Kit 2 is now in preparation; the teacher will be able to identify non-standard features of a student's language and then to select individual materials to meet the needs and priorities of the student.

ED 040940 - SP 003981

PAGE 73 IS MISSING FROM THE ORIGINAL COPY OF THIS DOCUMENT AND IS NOT AVAILABLE AT THIS TIME FOR FILMING BY E.D.R.S.

10/ 13/ 70

style. Since the teacher is the greatest single resource available to the student, the teacher, the argument goes, can be more effective if he can be made more creative and be given a better understanding of himself. Hence the center's major concern is to make its program highly "personalized." Teachers, it is felt, tend to teach as they were taught and thus the education of a teacher should provide a good model for his work in the years ahead. In a nutshell, this approach recognizes that different teachers have different ways of evoking learning in students and it encourages each teacher to become increasingly skilled in his own particular style of teaching. By making teacher education more personally meaningful for the teacher-to-be, the center expects to facilitate his learning and also improve the current wasteful ratio whereby only one of every two or three persons trained as a teacher stays in teaching for more than a year or two.

The central, unifying activity of the center is the Curriculum Building Program. This program is served by four research and consulting groups (School Input, Personalization, Assessment, and Learning Technology) and by three supporting services (Data Processing, Radio/TV, and Dissemination). Of the research and consulting groups:

- School Input, primarily a consulting division, contains principals, supervisors and teachers collaborating with groups building interdisciplinary modules to ensure that the realities which exist in public schools are represented in program development decisions. These persons also collaborate in the pilot testing of modules in schools.

- Personalization, in its research function, is probing the needs, concerns, strengths, and deficiencies of the student teacher during his pre-service and early in-service development.

- Assessment is concerned with research to establish validity and reliability of scoring systems, behavior coding systems and evaluation.

- Learning Technology is helping those groups developing instructional modules.

There are three interdisciplinary groups building modules. Their areas of concern are broadly divided as follows:

1. Laboratory Experiences. The products for this year should include four modules for introducing teacher candidates to the complexities of school organization, one or two modules of computer-assisted instruction designed to teach systems for analyzing teacher behavior, and several Teaching Laboratory modules which provide alternate strategies for introducing candidates to the reality of teaching.

2. Curriculm-Based Instructional Approaches. These groups are developing teacher training modules in science, mathematics, language arts, and social studies. The science group is identifying and sequencing tasks which should be taught in an exemplary teacher education program, and is designing modules that teach those tasks. Twenty-four units are planned, of which twelve have been developed through the first trial edition. Six modules are planned to teach skills related to the teaching of mathematics. There are also module series under development in language arts and social studies.

3. Personalization. One project here aims to help beginning teachers through their early "stage fright" so that they may more readily become concerned about their students' problems. Another trains counselors to help beginning teachers increase their self-awareness and understanding. This latter involves analysis and feedback of an objective and projective assessment battery, of videotapes of the student teacher at work, and placement in a student teaching situation calculated to stimulate professional growth.

The Teaching Laboratory, seeking ways of bringing the reality of teaching to pre-service training, has developed a series of experiences for secondary candidates during their first course in teacher training. Basically, it consists of putting the student teacher in a small classroom to teach a series of short lessons to his peers, employing principles he has learned from a written guide. The session uses audio tapes and video-tapes to permit later evaluation by the student and the class. In format, this resembles projects at other locations. In content, it differs from most in putting its emphasis on a broad application of a problem-solving, rather than the learning of specific teaching skills.

The content was selected because of all courses offered in the college curriculum it was seen as the least liked by students. The project is now turning out about 325 students a year. Several graduate students who have served as instructors in the program have graduated and are going to other teacher education institutions to introduce the teaching laboratory activities. Informal evaluation yields a fair amount of favorable anecdotal feedback from former candidates who are now teaching. The impact on children is considered hardto measure since the teaching laboratory is an early experience in teacher training with several courses and many factors intervening before the candidate becomes a full-fledged classroom teacher. One contribution of the laboratory seems to be that it has moved practice in classroom teaching, and critiquing of that teaching, to a much earlier point in the curriculum, a move that is obvious and long overdue.

Among the groups developing teacher training modules for specific areas of curriculum, the science group is the biggest undertaking. It has 12 of its 24 planned modules now well along in development. The modules are designed to help teachers teach any science program, old or new, with the AAAS Science Program the current vehicle since it is used by 9,000 teachers in 91 districts in Texas alone.

The project was designed after a sample of teachers assigned to use the AAAS program had been asked what skills or preparation they felt were lacking when they began using the program. As a result, the center's project attempts to achieve four goals:

1. Make the teacher competent in the subject matter to be communicated;
2. Teach the teacher the rationale for the science program so that he can translate the task to be taught into what he must do with or for his students;

3. Give the teacher practice in teaching the program;
4. Help the teacher to generalize this approach to other subject areas.

The AAAS Science Program supplies the objectives to be attained by students. Effectively, the center has taken these objectives as the starting point and is trying to determine what teachers must be taught in order to develop the desired behaviors in students.

One of the problems of the region is that nearly 90 percent of Spanish-speaking Mexican-American students fail to graduate from high school. Teachers are blamed for some of this. There is, it is felt, a long tradition of indifference on the part of teachers to the Mexican-American culture. This indifference "tunes out" teachers to the needs of Spanish-speaking students, so that many students are alienated and drop out.

The center is producing teacher training units in collaboration with the Southwest Laboratory to help overcome the indifference and make teachers more effective with the laboratory's materials for Spanish-speaking students. The products will be a manual to teach the teacher to use the materials and a film to motivate the teacher to use the manual.

The project is one of the few examples encountered of close cooperation between a center and a laboratory. It also involves something of a reversal of roles in that products are usually produced by laboratories, not centers.

Stanford Center for Research and Development in Teaching
Stanford University
7070 Welch Road
Palo Alto, California 94304

Mission

The Stanford Center for Research and Development in Teaching has been functioning as such since September, 1965. A changing perception of its mission has led to a revised statement of its problem area. The Center now perceives "the urgent need for a fundamental reformulation of the future role of the teacher." Its mission now is "to specify as clearly, and on as empirical a basis as possible, the direction of that reformulation, to help shape it, to fashion and validate programs for training and retraining teachers in accordance with it, and to develop and test materials and procedures in use in these new training programs."

The Center's projects and activities are nearly all long-term, slowly unfolding efforts which begin with fundamental research and gradually develop toward an applied goal in teacher education, teacher behavior, or student learning. With projects which gradually change from research to development in this way it is difficult to classify an entire project as research or development. To make it more difficult, in keeping with a university research atmosphere, it is Center policy to encourage some open-endedness to projects in hopes of "spin-off."

Roughly 80 percent of Center projects can be considered as relating to teacher education, although this figure includes all projects expected ultimately to have impact on teacher education. At the moment, a much smaller proportion (about 20 percent) of the effort is devoted to developing materials or procedures intended to change a teacher's performance capabilities; most of the effort is still in the research stage.

The Center confines its interest to creating innovations in teacher education, leaving it to others to implement, install, or conduct broad-scale training of teachers. The main determinant of programs is the professional interests of the staff members, modified by a subjective recognition of the nation's educational needs. All proposed projects, however, are systematically checked for consistency with the Center's mission.

To achieve the mission of the Center work is being carried out in three major areas:

1. Heuristic teaching
2. The environment for teaching
3. Teaching the disadvantaged.

The published intent of the center is "to improve teaching in American schools, but at least some staff members give higher priority to (1) understanding the skills teachers need to teach effectively, and (2) building good models of teacher education.

Some of the assumptions on which the Center management operates are that the computer will become a major factor in education, that schools will become "unlocked" (in the sense that there will be much more individualized instruction in place of the present classroom "lock-step"), and that the teaching function will change significantly. It is felt if change is to take place, it is important to design things that teachers can use and to teach teachers new skills, rather than try to design the teacher out of the instructional system. This calls for a major step toward the full professionalization of the preparation of teachers, especially the university teacher.

Teacher Training

As indicated, all the Center's 25 projects are expected ultimately to result in systems, procedures, or materials that will have an impact on teacher education. Many are designed to produce information that will ultimately influence the nature of a teacher education development activity and are, by our definition, peripheral to the present report.

Eleven projects list something in the way of teacher training in their goals. Each is identified here with a brief description of its nature and/or expectations. Since the microteaching project has been the most extensive activity to date and since the model has been adopted by many teaching institutions, more space will be devoted to its description. This should not be taken to mean that either the writers or the Center staff consider this project more or less important than any other.

1. Teaching the disadvantaged.

This program of research and development seeks to define the educational needs of disadvantaged communities, and to discover ways of being responsive to those needs. The goals include development of materials to help teachers adapt curriculum to disadvantaged students, use of techniques more appropriate to such students, help for the teacher in dealing with crises, and preparation for teachers to function as representatives of community and the educational profession. Materials will be designed not only for teachers, but for parent groups and community organizations. Though a series of audio tapes of interviews has now been produced, teacher training materials have not as yet been put into development.

2. Educational community organization.

This project attempts to help communities develop competence in assessing the strengths and weaknesses of their educational institutions, to help them develop alternative educational policies, and to translate their interests and objectives into the means required to achieve them. The project intends to (a) identify community-defined educational needs, (b) identify and codify procedures used by disadvantaged communities to make school systems responsive to these needs, and (c) develop materials for teacher education in the field of educational community organization. Expected end products will include manuals, tape recordings, videotapes, and possibly films for educating teachers, community leaders, and other educational personnel. Though a store-front facility was opened in a largely Black neighborhood in East Palo Alto, and though project personnel have developed contacts and attended many meetings (while maintaining logs and diaries), the project has not yet matured enough for teacher education materials to be developed.

3. Teacher training: standard English as a second dialect.

This is primarily an effort to develop a teacher-training syllabus in standard English as a second dialect. Literature has been searched, contacts have been established, and a research memorandum has been published. Though the plan calls for the development of models for microteaching lessons, none have been completed to date.

4. Developing problem-solving skills through students teaching students: use of small groups.

This project aims to have sixth-graders teach first-graders, and thereby improve the learning of the sixth-grader. The interest is not so much in helping the first-grader as in helping the sixth-grader by the learning-by-teaching treatment. It is expected that a series of manuals and curriculum materials for tutorial activities will be written and evaluated. Presumably these will include materials to teach teachers how to use this technique. To date, one group of sixth-graders has received training in instructing first-graders, and a report has been prepared.

5. Small group interaction.

It has been found that teachers behave the same when teaching small groups as when teaching large groups. This, plus the need for teachers to be able to restructure their role as innovations appear, has led to this project. The goals of the project are to determine how student teachers acquire new concepts of the teaching role, and to develop an experimental course which includes those components found to be most potent. Though a pre-service training program is part of the plan, research has not progressed to the point where development of this training is appropriate.

6. Heuristic teaching.

This program includes four projects which aim at promoting self-motivated, sustained inquiry in students and which emphasize affective as well as cognitive processes. Studies in process or planned will lead to products for training teachers how to listen, how to handle alternative hypotheses and inferences, how to make "professional decisions," how to detect errors in student thought, and several others. In four years, the Center expects to have a general process taxonomy of heuristic teaching styles and a model teacher education program that will include detailed content specification. All of the work of this project should lead to teacher training components; to date none have been completed.

7. Microteaching and intern data bank.

Microteaching was developed at this Center, and has since been picked up by a number of institutions. The Far West Laboratory, for example, emphasizes microteaching in teacher training and is developing more than a dozen microteaching units for broad distribution.

Microteaching rests on the assumption that trainees can be taught specific skills of social and instructional interaction. The Stanford project attempts to determine not only the effect of a microteaching unit on the teacher trainee, but the effect on the students that trainees teach. In addition, data on the trainee are collected over a five year period (prior to, during, and after training) to determine the durability of the microteaching changes.

The staff is careful to emphasize that microteaching is the technique for imparting the broad technical skills of teaching through scaled-down practice of specific skills with small groups of students. The skills for controlled small group discussions (listed as "h" below) have not been as fully delineated as the other skills to which the Center has given attention, as follows:

a. Reinforcement
b. Probing
c. Higher order questioning
d. Analytic questioning
e. Silence and nonverbal communication
f. Cueing

g. Set induction

h. Skills for control of small group discussions.

A series of films has been developed to provide instruction on the skills and microteaching technique. The Center also has videotapes on the technical skills for use in training and these are being made available at cost. Summer clinics on microteaching have been continued.

8. Uncertainty studies.

This is a project to develop teaching methods to reverse the trend toward applying old solutions to new problems when a different or modified solution would be more appropriate. It is expected that videotape examples, manuals, and materials will be developed as part of a teacher training component. A workshop for teachers was conducted this past summer to train teachers in uncertainty; teacher training materials were prepared and used in trial form during the workshop.

9. Personal competencies.

Elementary and secondary classroom teachers typically get little training in improving their own social competencies and in techniques of behavioral analysis. More, little is known about how to train or retrain teachers to deal with a wide range of inter-personal problems. This project aims to correct that need and, among other goals, intends to create a series of training procedures to teach behavioral analysis skills that might be useful in inter-personal situations. This project is in its early stages and the teacher training component has yet to be attempted.

Several projects concerned to adding to teacher competence have been completed. Materials or strategies produced include a training film and manual designed to incorporate research results in role-playing, and the training syllabi developed as part of the foreign language teaching project.

The Center has no standard system for developing innovation in teacher education. Instead, the process is left to the professional judgment of those responsible for the project, an approach which seems to be an accommodation to the preference for autonomy of an academically-oriented staff with widely differing viewpoints and approaches.

There is some concern that the Center should not "reinvent the wheel." As one piece of evidence of this, the Heuristic Teaching Program adapted for teacher use a commercially available program for teaching salesmen to listen.

Wisconsin Center for Research and
Development for Cognitive Learning
The University of Wisconsin
1401 Regent Street
Madison, Wisconsin 53705

Mission

The Wisconsin Center for Research and Development for Cognitive Learning places its emphasis, as its name implies, upon the improvement of education through a better understanding of cognitive learning. To that end, it pursues the following:

- Basic research on the conditions and processes of cognitive learning;
- Research on instructional variables and the development of instructional systems;
- Development and testing of organizations that facilitate such research and development in schools, help students to learn, and improve the in-service and pre-service education of teachers;
- Develop tested means to help schools select and use the results of research and development.

The Center aspires to accelerate a student's progress by one year during the six years of elementary school. This it expects to do more through changing the role of the teacher than through development of instructional materials.

Teacher Training

The Center's major impact on teacher education to this point has been through the creation of a new style of organization for elementary schools. Working with a group of pilot schools, it has changed them from the conventional self-contained classroom systems to what is called the multi-unit school.

A unit is an organizational entity which plans and guides the total experience for a group of between 75 and 175 children, combining two to four grade levels. At the classroom level, the unit will include two or more teachers, one of whom is the leader who spends up to two-thirds of his time teaching, while the other is a staff teacher whose main functions are to plan, conduct, and evaluate instruction. There is also a teacher aide, responsible for non-instructional tasks such as grading papers, and a secretary. At the second level of organization is an instructional improvement committee composed of the unit leaders, the school principal, and, in most cases, consultants from state or local agencies. At the third and highest level is the system-wide policy committee, chaired by the school district's superintendent and including principals, representative unit leaders and teachers, and various consultants and central office staff.

In the Wisconsin experiments, seven schools have been operating completely on the unit basis for the past two years under center guidance. Research and development has been the responsibilities of the center. The State Department of Public Instruction (DPI) has been involved in both planning and development and has responsibility for implementing the new approach on a broader basis. Next year, the number of schools operating under center guidance will be cut to four and the relationship will probably be less intensive. On the other hand, the DPI's interest in the experiment will be increased. Last year, it set up 10 "lighthouse schools" modeled after the project school. Next year, it plans to have 25 such schools. The lighthouse schools vary in size, with a faculty of from six to 25.

The development of multi-unit schools has led to a redefinition of the activities and responsibilities of principals, teachers, and others. An outgrowth of this is the center's effort to get certification for unit leaders. This is an attempt to develop a path by which elementary teachers can further their careers without being promoted out of their skill areas into administrative jobs.

In the first year of full-scale operation of the multi-unit system, the center provided eight weeks of training for all teachers concerned. Now, the center puts on about four workshops per year for unit leaders who then train their own staffs. The workshops are brief (three days, plus) and are designed to familiarize and orient rather than to give intensive training in leading or teaching within the multi-unit system. A substantial proportion of each workshop is given to organizing personnel into the new administrative units and committees. Aside from the unit system, the center has conducted a few other brief workshops on such topics as adult-student conferences and evaluation methods. In introducing both the unit system and new curricula the center appears to expect teachers to "learn by doing," for the most part, after brief initial discussion of key concepts involved in the new technique.

Curriculum development projects at the center include rather extensive elementary curricula in reading and mathematics. The effect on the actual curriculum of schools has varied, however. Schools are invited to try out materials developed by the center but are free to ignore them if they wish. Reading and mathematics materials developed by the center are being tried experimentally in some of the cooperating schools. The center's concern with curriculum development has been increasing since lack of good materials has been one of the problems identified.

The potential impact of the Center is the greater because of the close linkage between the center and the DPI. The DPI has long had ties with the School of Education and most of the professors in the center are members of the School. A further helpful factor has been the geographical proximity of all concerned -- all of the agencies are in Madison.

Considerable attention has been given to liaison in an effort to create smooth-running operations. A liaison committee which meets monthly and a full-time staff member of DPI have, for more than two years, coordinated all activities between the Center and DPI. As part of his job, the coordinator visits any school in the state in which there exists a project that might be considered innovative. In addition, other agencies also have liaison. Each of four cooperating teacher education institutions give one-fifth of a man to support and monitor lighthouse schools. Similarly, the DPI provides one-fourth of four persons.

Success in projects such as multi-unit schools, particularly during the growing-pain period of development, requires strong leadership. A member of the center staff postulates that a school's reactions to the multi-unit approach are strongly positive when the school is well run, less so in other schools. No single fully organized multi-unit school has been discontinued in two years, but single isolated units have been dropped in about 30 percent of schools. In one city (Madison), the project has been less than a triumph. In another city (Racine), by contrast, the city itself increased from four to ten the number of schools using the multi-unit approach. It has also staged its own workshops for the third consecutive summer; this year, over 250 teachers and principals participated in a six-week workshop.

Student performance -- which might be considered the true test of the merit of any approach to education -- is variable. The center does not expect appreciable gains in academic achievement for two to three years. They point out that the first year is necessarily a shakedown period for the teacher and students. Achievement as judged by standardized tests and item samples has yielded mixed results in the second year, with the greatest variance occurring among units rather than among schools. In the current (third) year, there is optimism that gains will be greater.

Other behavioral indicators which tend to confirm favorable reception of the multi-unit approach include a report from one principal that he has had 50 percent less turnover among teachers since installation of the "lighthouse school." Five teachers who had to be transferred from his school asked to be sent to another using the new approach. One school has reported a notable increase in attendance. In another case, 67 children temporarily assigned to a lighthouse school were to be transferred to another school. Their parents protested strongly and the parents of 65 of the children agreed to pay transportation expenses to that their children might stay in the same school.

In Racine, every project school had a better attendance record than its control. Teachers also noted a marked decrease in half-day skipping (a statistic which does not normally show up in attendance records). One principal reported a marked decrease in the vandalism bill for his school.

An evaluation of the project by Roland Pellegrin of Oregon's Center for the Advanced Study of Educational Administration concluded that in the multi-unit schools teachers work together more than in conventional schools. It also concluded that teachers felt they had a greater share in decision making in the multi-unit schools. It was further noted that the unit leader takes over many of the functions of a principal, with a result that teachers perceive a shift in power from principals to leaders.

The attitudes of teachers and students are being surveyed. In the lighthouse school program it is planned to follow the students for five years to examine attitude change and changing types of activities of the students.

As a matter of polity, the center has tried to transfer to other agencies the responsibility for in-service teacher training, retaining its own funds for research, development, and dissemination. Beginning this year, the installation of the multi-unit system will become the responsibility of the DPI and the center will no longer provide the training and other services previously available. While substantial support is available for teacher training from federal and other sources and while there are plans for creating such training about the multi-unit system, there are as yet no university courses for users of the system. There is currently some question as to how training will be provided for the new units to be installed by DPI this year.

A key question stressed by several members of the center is whether the ranks of elementary teachers can supply enough people with the qualities for the key role of unit leader. It seems likely that 15 to 25 percent of current elementary teachers might qualify as unit leaders although the majority of women teachers are reluctant to assume this role. One staff member comments that sometimes no person in a given school appears capable of effective unit leadership.

As presently structured, the rewards for leadership seem to be in the area of satisfaction from a job well done. The financial rewards are relatively insignificant -- an extra $250 to $500 a year for the team leader. (This compares with the normal annual increment for teachers of about $600.)

4. WHAT CAN BE SAID ABOUT DEVELOPMENT PROCEDURES?

The development of effective products and procedures is the primary mission of the laboratories. Thus one has to ask if the laboratories are places wherein the procedures for development are thorough and consistent with the state-of-the-art. Are the laboratories now, or are they becoming, models worthy of imitation in their manner of developing educational procedures and products?

This depends, of course, upon what one considers to be development. The definition of some laboratory and center staff members is in need of repair, we felt. Despite the fact that most, if not all, laboratory managers have written or are writing a paper on the nature of development, one heard comments such as, "We developed a draft of the material and now we're going to see how well it works," or, "We develop the materials and then they're tested by . . . (someone else)." Testing, however, is the very essence of development. The notion that development consists simply of writing a draft and then perhaps having a colleague or two look over the draft is naive and unworthy of financial support. Development must include testing and successive revisions of product or process until it performs according to prespecified conditions.

Not only must development include testing with the target population, but it is important that testing take place at the right stage. In many cases, testing begins far too late in the cycle. As a result, it takes the form of summative evaluation (testing to determine how well the finished product works) rather than the essential formative evaluation (testing during the on-going process of preparation to determine if the right ideas are being pursued in the right way). A policy of formative evaluation seems to us essential if problems are to be solved in a relevant and parsimonious way.

To find out the procedures used in development, we preferred to rely on observations rather than on published documents, simply because the sort of information we were looking for is seldom included in final reports. For example, we were interested in assessing the rigor with which laboratory management controlled developmental projects and the insistence with which they demanded adherence to agreed-upon procedures. To this end, we looked for, and asked about, management control documents which not only kept everyone informed of the developmental steps demanded but which called for initialing by persons responsible for carrying out or reviewing a step. In addition, we listened for comments indicative of concern for the collection of data that would reveal whether the product was working, and interest in modifying the product on the basis of data until it was functioning satisfactorily. Further, we tried to assess the depth of concern for products that would lead to growth and behavior change in students. Is there a sincere interest in students, or is the primary interest in another direction (e.g., publications designed to appeal to colleagues)?

The rigor of developmental procedures varies widely, but our feeling is one of optimism. After all, laboratories have serious obstacles to overcome. They have difficulty, for example, in recruiting experienced developers. In a different dimension, there is the problem of emancipation from the long-standing educational tradition of laying all blame for failure at the feet of the student.

But strides have been made, and in a relatively short time. We found, for example, laboratories with management control documents and flow charts describing developmental procedures. We found laboratories with sign-off sheets designed to insure that developmental steps were completed. We found laboratories which specified what their products should accomplish and which then gathered data on accomplishment. We found laboratories which insisted on testing their products and procedures on members of the target population. We found laboratories which are seriously concerned not to disseminate products before they demonstrate specified performance criteria. And we found laboratories which took effective steps to communicate their development policy to staff members.

But while meaningful development procedures burn brightly in some laboratories, in others they only glow and flicker. For example, there is, in our opinion, far too much reliance on the testimonials of teachers as a prime source of information about the effectiveness of products whose principal aim is to change student behavior. The favorable attitude of a teacher is important in the effective implementation of most products, of course, but teacher opinion is only fleetingly relevant when the nature or extent of student change is at issue, no matter how formally such opinions are collected. Though laboratories use a variety of consultants and specialists to assist with development, nowhere did we find students prominent among them.

There are discrepancies between theory and practice. One laboratory, for example, has an impressive paper describing the product development process and which is regarded as the basic set of procedures for all development work. It calls for an empirical approach, which, among other things, contains criterion tests based on behaviorally-stated learner performance. At present, however, the laboratory's main project has no such specific objectives and criterion tests. Instead, standardized tests are used to see how children move up the norm scale. At another laboratory, the testing philosophy still seems more norm oriented than criterion oriented. The item analysis procedure used is one that calls for deletion of criterion items that all students get either correct or incorrect, no matter that these items precisely measure achievement of some objective as development procedures demand.

There is unevenness in the nature of the items to which rigid developmental procedures are applied. Laboratories are relatively rigorous in developing products to teach students, but workshops for teaching teachers to _use_ those products seem sometimes almost casually put together and only casually validated. And publications intended to communicate appear not to be tested at all. But in a sense, laboratory personnel are somewhat like an obstetrician suddenly faced with the problem of performing a kidney transplant; the new task is in the same general profession but demands the application of different procedures and a different kind of rigor. Most laboratory managers are aware of the difference between state-of-the-art development and current practice, and are either planning to take steps, or are taking steps, to improve. As we indicated at the beginning of this Section, we are optimistic.

5. WHAT ARE THE PROBLEMS IN GETTING THE WORK DONE?

If the laboratories and centers serve a useful purpose (and we believe that they do), what can be done to help them do their job? There was widespread agreement about a number of factors which inhibit the smooth completion of missions. Most of these are covered in some detail in our recommendations and are mentioned here only briefly. There is one problem, little mentioned by those we interviewed, but which to us, from our one-step-removed position, appears to be a major one. Because we have no solution to offer, we have not included it with other problems in our recommendations. Instead, it is discussed at the end of this section in the hope that discussion will help to define the problem as a first step towards its solution.

Probably the most frequently mentioned problem is that of recruiting and retaining qualified personnel. At the moment, there is no major source of trained product developers. Finding those who are qualified is no small task, and retaining them is not easy when long-term support is so uncertain. Thus laboratories which would populate themselves with skilled developers must,to an extent, "grow their own." Inevitably, this in-house training cuts into the productive time of their staffs.

While we have some recommendations about the budgetary implications of this, we do not consider this an altogether unhealthy situation. The problem is a familiar one in industry, which long has complained of the amount of training it has to undertake because the educational establishment is unresponsive to its needs. In general, the training provided by and for industry is highly pertinent to needs and, moreover, it changes rapidly to meet changing needs. Similarly, the pressure is on the laboratories to provide training that is relevant and efficient, two qualities not necessarily found in the institutions of higher learning from which laboratory staffs are typically drawn. We are optimistic that the practical training experience gained in this area will have beneficial effects elsewhere in the laboratories' activities.

Related to recruiting is the problem of developing "middle managers." Perhaps this is because laboratories and particularly centers operate in the university environment in which the role of administrator is not usually held in high regard. Whatever the reason, managers have difficulty in convincing staff to become administrators. And when appointments are made handsprings are turned to find position titles that avoid the terms "administrator" or "manager." A popular title that results from these gyrations is that of "coordinator." While this might sound like a small problem in semantics, it has other ramifications. The attempt to becloud the title also leads to confusion over function; the coordinator becomes a person whose bland duty is simply to smooth the way, rather than a leader whose virile role is to expand and enhance the strengths of his subordinates.

Another item mentioned under the heading of problems and for which we have no recommendation was "excessive site visits." The cliche around the circuit is that "the plant is pulled up by the roots to see if it is still growing" so often as to hinder growth and productiveness. We found, however, that feelings about excessive site visitation vary tremendously, which may be news to those who cry the loudest. At one extreme was an institution some of whose personnel claimed that up to 25 percent of their time is spent either in preparing budgets and proposals, or in preparing and assisting with site visits. At the other extreme were laboratory managers who not only felt that such activities consumed less than 2 - 4 percent of their time, but who welcomed visits from DEL personnel because these were largely constructive and helpful.

Several laboratory staff members described what they consider to be a serious copyright problem, the problem stemming from confusion regarding ownership of various materials in development. Though we don't understand why a clear statement of policy is not available to those concerned, we do understand that uncertainty about authorship and ownership can seriously hamper successful completion of a group enterprise.

Many people spoke of the problem of obtaining and scheduling members of the target population for developmental testing sessions. This is time-consuming and can require preparations which seem to have little to do with the business of product development. But we were cheered each time we heard descriptions of the difficulty of test scheduling, feeling that it indicates a determination not to shortcut the most critical step in the development process merely because of inconvenience.

We were the ones who asked the question, "What are the problems in getting the work done?" and we do not mean to imply by any of the foregoing that these problems are either uppermost in the minds of most managers or that they are used as excuses. Most managers take these problems in their stride. The question was asked mainly to provide further insight to the orientation of an institution and to offer managers an opportunity to make an input to the recommendations with which we conclude the report.

There remains for this section the major problem to which little attention is being given at present. In a nutshell, it is this:

> American education appears not designed to be successful. Or more explicitly, it is not designed in a fashion that makes the effectiveness of instruction its overriding concern.

In the university, and, to a large degree, in the public school as well, the major rewards for a teacher are not related to the effectiveness with which he changes students and helps them grow. In the university, the rewards of the establishment are almost totally divorced from effective instruction. Rather, they are contingent upon such peripheral matters as publication, committee membership, and success at garnering government contracts.

Worse, there are many quarters where the instructor, be he professor or teacher, feels it his inalienable right that the establishment not even know what he is doing behind his classroom door in terms of effective teaching. Only in relation to public school teaching is it commonly admitted that there is a difference between knowing a subject and being able to teach it. Such an admission is not generally made at the university level, where the requirements for becoming a member of the faculty include nothing to do with the so-called profession of teaching.

Teachers who are highly successful are often forced to hide the fact. For what would happen to a teacher who was so successful that all students reached all objectives -- and then received an "A" for their efforts. Is such a teacher applauded and revered by the system? Does he find stature among his colleagues improved? Here and there, perhaps. More likely, pressure will be applied to submit grades according to the religion of the curve, and colleagues will be indifferent or punitive.

The fact that most of those who make up the educational establishment are genuinely dedicated to doing a good job does not change the picture; it means merely that all these people work harder at whatever each defines as "a good job." And somehow over the years it has come to mean "what the teacher does" rather than "how the students grow."

It is in this environment that the products of the laboratories are expected to function. Products and procedures which have been developed and shown to teach effectively while under the developer's control are put to work where effective teaching simply doesn't matter very much.

The laboratories are aware of the problem, and some expend considerable energy in trying to make the impact of their work approximate its potential. Teachers are trained to use products and procedures, laboratory personnel monitor the classroom activities of teachers returned to their schools, and supervisors are trained to monitor teacher activity and product usage. Some attempts are even being made to redesign the school structure to one where more effective teaching is not only possible, but is the principal basis for reward and advancement. (The attempt to develop a competency-based teacher training program by the Northwest Regional Laboratory is noteworthy in this regard.)

Despite the efforts of individual laboratories, we feel that much more must be accomplished if the nature of the educational system is not to limit severely the impact of laboratory products.

Briefly, we see the situation like this: R&D centers have responsibility for developing knowledge and ideas that might become products and procedures to "improve the quality of education." Laboratories are responsible for developing such products and procedures. But no entity is responsible for changing the educational system into one where teachers are rewarded for what they achieve rather than for what they do, where the principal passion and focus is on the nature and extent of student change.

To change the quality of the environment into which the efforts of laboratories and centers are poured, and to change them quickly, seems to demand talents that are not commonly found in the system at present. It calls for redirection, communication, and persuasion, directed not only at teachers and administrators, but at parents, voters, school boards, the political systems, the mass media, to name a few. Any appropriate organization would not contain a majority of researchers and educational developers, but would concentrate on "action people" -- politicians and political scientists to show how and where power is applied, the persuaders from the mass media with their skills in changing images, and certainly some students.

Change is imperative, we feel. The issue is one that warrants as much attention as did the issue for which the laboratories and centers were brought into being. We do not feel that the laboratories and centers are appropriate instruments for this new purpose since they are of the system that should be changed and, additionally, they do not have the right mix of skills.

Something essential is missing. And we think that something is an institution or series of institutions whose primary goal would be to create and develop ideas aimed at making effective teaching matter.

6. WHAT EFFECT ARE LABORATORIES HAVING ON TEACHER EDUCATION?

This is not a fair question, not at this point in time, at any rate. It is like giving a crowbar to a dedicated worker and then asking after three years if he has succeeded in moving the Rock of Gibraltar.

Although the question may be premature, laboratories and centers are having an impact on teacher education. Probably the largest impact at the moment is on the hundreds of teachers involved in developing educational products or in their installation and use. These teachers come under the direct influence of the laboratories and centers.

Less clear is the effect of teacher training efforts on university education departments. There is potential impact on such programs but it is difficult to judge whether recent changes are due primarily to the efforts of laboratories and centers or to other influences in the social environment.

The ultimate impact of the laboratories will be heavily dependent upon the quality and quantity of "dissemination," a word we put in quotation marks because of the multiple meanings and uses around the laboratory circuit. For some, the term means communication, for others it means implementation. For this discussion, we will use it as a general term to cover both activities and will refer specifically to communication or implementation when appropriate.

Communication is handled in a variety of ways at most laboratories. Professionals deliver papers and participate in seminars at professional meetings, and communicate with each other by phone and visit. Most laboratories have a report and memorandum series which is sent at least to other laboratories and to centers. In some cases, the mailing list includes several hundred names of school officials, teachers, and research organizations. The monthly Library Bulletin 69-7 (July 1969) of the American Institutes for Research, for example, lists four reports from laboratories and twenty-five from centers.

Several laboratories have a person assigned as "chief disseminator" whose main task is to communicate laboratory activities and results to the outside world. This, we feel, is an excellent practice, but unfortunately these individuals have such limited powers that they are unable to insist upon clarity in the writings of professional staff.

Overall, the attention given to communication is distinctly spotty. It appears that a mechanism for systematic communications does not yet exist, and where it does take place it is serendipitous and generally uncoordinated.

One might question whether a high degree of communication is necessary or even desirable. But the absence of communication certainly has one disadvantage: it hides duplication of effort and provides fertile environment for activities that can be described as "reinventing the wheel." One person, for example, reported that he was writing a position paper on individualized instruction, thinking that some day a computer might be useful in assisting in the management of instruction. In view of the several individualized instruction projects boasting several years of on-line experience this project seemed somewhat dubious in value -- until the experience of others has been understood and taken into consideration.

There are several reasons why communication appears to be minimal. One is that laboratory personnel are so busy doing things which they feel are of great importance that they have no time for such "busy work" as communication. Another is that there is at least some feeling that what the "other" laboratories are doing isn't worth knowing about, at least not yet. But only one laboratory director went so far as to suggest that the best way to strengthen the laboratory program would be to close down all the other laboratories and "give us all the money." Too, there is a feeling at some locations that communication is already satisfactory.

Implementation is a somewhat different story. Here the concern is with getting products and procedures into use by those for whom they are intended. To this end, other activities are relevant and have, in the main, been undertaken. Most laboratories are aware that mere development of a tested product is not enough to insure implementation, certainly not under the conditions required for effective use. And here is where much of the teacher training is directed, in teaching teachers how to use those products and procedures. For several laboratories, the development of a teacher training component is an integral part of the product development cycle, indicating a growing sophistication in the evolution of development procedures.

Implementation activities cover more than teacher training, however. Implementation begins before pencil is put to paper at some laboratories, when steps are taken to understand the essence of a problem worthy of solution. It continues throughout the design of the solution as that design shapes the product to the hand of the user. Implementation is also influenced by the packaging of the product, an aspect of development that should take on more importance as laboratories gain experience.

Accurate implementation is more likely when the user has been involved in the shaping of the product. And "getting the user involved" is one of the things we feel most laboratories are doing well. Teachers and administrators are consulted early in many projects, and a wide variety of local personages serve on boards and committees. The intended user is often involved in the product testing, and his suggestions and recommendations are sought. There is a fair amount of interaction with members of state departments of education, an activity the laboratories are peculiarly adapted to because of their independent status.

Many laboratories have yet to reach the implementation stage in any significant manner, however, and so can only talk about intentions with regard to testing and implementation. We note in passing that these intentions contain what we feel is too little planning for determining product adequacy by looking at the student. Good development takes time, however, and there is time for this to change. If the Congress refrains from turning the money faucet off and on every year or two and supplies the necessary long-term commitment, we are confident that every reasonable step will be taken toward effective implementation. We feel, too, that as laboratories develop confidence from successful development of at least one or two useful items they will be more willing to learn from each other.

7. HOW DO LABORATORIES COOPERATE OR COMPETE?

This is another question on which we were asked to comment that is not strictly related to the issue of teacher training. We believe that the request represents a concern over apparent duplication of effort and an apparent lack of program coordination. Of the half dozen or so professional outsiders we talked to about the laboratories, most voiced a similar concern that laboratories are "closed shops" to organizations whose primary business is also that of educational development, and suggesting that much could be gained from cooperation at least at the level of joint conferences or meetings.

But if it is true that there is something less than total program coordination and cooperation between laboratories (although we are aware of several instances where it does occur), there are some factors that explain, even if they do not justify, the situation. When five of the original twenty laboratories were phased out, the reason was not made clear to those remaining. Conditions were thus ripe for rumors, and fly they did. The most popular seems to be that these laboratories were closed because "they didn't produce enough products fast enough." Since others do not want to experience a similar fate, the "product pressure" perception nourishes a dedication to proceed apace with immediate projects and to perceive cooperative projects as a luxury to be afforded only after stronger indications of continued existence have been received from sponsors.

The fact that laboratories vie for a piece of the same dollar pie leads to some feeling of competition. It should surprise no one that some laboratories are working hard to broaden their sources of support so as to reduce the uncertainty of Office of Education sponsorship.

Too, as indicated in our discussion of dissemination, laboratories _are_ cooperating with a significant number of agencies -- schools, centers, state departments of education, citizen groups, and others. That their cooperation with other laboratories at this moment is limited should only be interpreted to mean that other laboratories are not seen as relevant to the immediate success of a given project.

8. WHAT IS THE EXTENT OF DUPLICATION OF EFFORT?

There is only one instance of apparent duplication -- in the area of reading programs. It seems that almost every laboratory is building or revising or testing some kind of reading program designed to teach English either as a first or a second language (even though cryptic product labels may somewhat disguise the intent). There are, however, enough differences in substance or in procedure in these projects to make a charge of "serious duplication" unfounded. Even if these programs were identical it is likely that the seriousness of the problem would justify the size of effort. After all, the total laboratory program is so small that even if all funds were directed toward a single project it could hardly be described as a "massive" effort. Whatever else may be plaguing the laboratory program, serious duplication of effort is not among them.

9. RECOMMENDATIONS

Our recommendations touch on matters of varying importance and are not grouped in any order of priority. They were developed from observations made during site visits, from comments and suggestions made by those kind enough to talk with us, and from our own experience. Two factors color our recommendations:

1. Our conviction that the laboratory program is important to the improvement of practices and materials in American education, and that the program should be strengthened and nurtured.
2. Our sense of humility at offering firm recommendations in the face of an incomplete understanding of the entire laboratory program and an incomplete understanding of the mechanisms, powers and constraints of the Office of Education.

The focus of this report is upon teacher education activities. We were asked, however, for recommendations that would "strengthen the laboratory program." This was a wise request, as it would have made little sense to confine recommendations to those that might affect teacher training projects and activities.

Inevitably, when one looks at any kind of organizational entity, a major question arises as to whether the organization is so structured as to attain its goals with the greatest efficiency. In examining the system of educational laboratories and centers, we, too, asked if some other approach would have been more efficient, whether these institutions have too much or too little autonomy, whether their goals were well selected, whether they should be more traditional or more innovative in their approach. In conversations, we found almost as many opinions as speakers.

Our conclusion is that it was a master stroke to organize the laboratories as independent, non-university organisms, away from an environment wherein research and publication tend to be more highly regarded than effective teaching. Because of this arrangement, we feel laboratory managers are learning to manage, coherent development strategies are emerging, and the performance of the student is slowly rising in importance as the ultimate criterion of success.

Many of the individuals we met are plainly fired by a vision of providing products and procedures that will demonstrably and unequivocably contribute to the solution of a pressing educational problem. Here is a significant difference between what some laboratories are attempting and traditional educational research. The laboratories are becoming, in our judgment, strong mechanisms for development and installation of effective education tools. We feel that in some degree at least this is happening because of the independent status of the laboratories.

Recomendation 1: We strongly recommend that there be no change in the organizational status of the laboratories.

Research needed to reduce an idea to practice is seldom adequate to carry a product through its complete development cycle. Put another way, research appropriate for determining whether an idea will work at all is not the kind of research needed to determine what configuration the idea must take to work under conditions of reality. It is one thing to experiment to determine whether flying is possible at all, and something else to experiment to determine what shape a wing must take to carry a given payload.

The centers have responsibility for discovering ideas and procedures for improving education. Laboratories are responsible for developing those ideas into viable products. The centers do not provide all the answers needed for effective development, however. The laboratories' developers continually must experiment to answer questions about the parameters of the idea they are developing. Often, it is hard to tell whether the experiment to answer a question should be considered as research or as development.

Attempts to interest R&D centers in finding these answers reportedly meet with little success. This is hardly surprising; the centers have their own work programs, their own budgets, their own priorities. Any request for back-up research may arouse interest, but there is likely to be little response. Moreover, it is difficult to imagine a university-based organization functioning as a service center to the laboratories except on its own terms. We are aware that there are joint projects between laboratories and centers. Nonetheless, it is unlikely that centers could retain their professional staffs if they devoted a considerable effort to service research. Nor do we feel such would be desirable.

Recommendation 2: We recommend that OE policy should encourage laboratories to carry out research that directly supports the development of product or procedure. Such a policy should improve the solidity of information on which development is based, and should remove one influence tending to put products into use before thorough development has been completed.

Occasionally, when asked who monitors the progress of their project, junior personnel would answer, "We don't know." When asked how they knew if they were doing good work, the answer would be, "We don't." From such comments we conclude that though management may be clear on the goals and evaluation strategies of their organizations, this information is not fully transmitted to all staff members. It would be interesting to ask each junior project person to complete a questionnaire asking about his organization's mission, and about how his project is monitored and evaluated for success. Results would vary from one place to another, of course, but we believe that they would also show a general looseness of communication between management and project personnel exists.

Recommendation 3: DEL should urge managers to establish explicit procedures through which downward as well as upward communication will be assured on a regular basis.

Laboratory project managers and laboratory directors often come from a university background where administrators are generally not held in high regard, where administrators are careful not to refer to themselves as managers, and where it is socially acceptable to accept an administrative post only with a display of reluctance. As a result, laboratory managers have probably had modeled for them a passive, non-directive form of management. Laboratories, however, must be actively managed rather than passively administered. Decisions must be made and staffs must work as a team to carry out those decisions if effective development is to occur with efficient use of the taxpayer's money. Until now, laboratory managers have had to learn through the battering of experience that the making of a firm decision does not necessarily lead to catastrophy or to being ostracized by colleagues.

Recommendation 4: We feel that the Office of Education can strengthen the laboratory program by promoting management as a new skill and then offering or supporting some form of management training to laboratory personnel, especially those at the middle levels. Though we do not suggest the form that this training might take we would strongly urge that it be designed to speed their adoption of the active manager model wherein managers direct rather than react.

Though laboratory personnel are generally sophisticated about instructional technology, they tend to be naive about the political facts of life. They appear, for instance, large unaware of the kinds of pressures experienced by the Office of Education as it tries to achieve its own missions.

Recommendation 5: DEL should provide at least semi-annual briefings for laboratory personnel on the "realities" of the political scene, on the implications of spending tax money, and on current problems and priorities as viewed by Congress and other influential bodies and persons.

This "political education" might be carried further. One laboratory staff member pointed out that currently if one wants to learn about the workings of the Office of Education, one must accept a full year appointment there. The length of this period restricts the number of people able to participate. The staff member suggested that OE should establish two- to four-week fellowships to permit a much larger number of laboratory personnel (number unspecified) to work with OE in Washington.

Recommendation 6: We recommend that such fellowships be established, believing that such assignments would result in a considerably better understanding of the "big picture" for a substantial number of people. We add to this recommendation our opinion that the length of such assignment must be carefully established and should be approximately one week longer than it normally takes to recover from the "cultural shock" of moving from the laboratory world to the Washington scene. It is well established that persons who move from one to another of two highly different worlds experience a general disorientation, and should an assignment be terminated before this reaction eases it is likely that a negative rather than a positive feeling about the new environment would be carried away.

The efficiency of laboratory functioning is hampered by OE policy. For example, although the Office of Education would like significant dissemination of activity and product information (and evaluates the laboratory, in part, on dissemination), there is a law which prevents laboratories from printing more than 225 copies of any document. To require laboratories to go to the U. S. Government Printing Office for print orders exceeding 225 copies reminds one of animal experiments wherein an animal can earn food in return for pressing one of two different bars. One bar delivers food after a one-second delay and the other delivers food after a five-second delay, and, of course, the animal quickly learns to go to the bar with the shortest delay. Similarly, the Government Printing Office represents the long delay, and so is avoided wherever possible. Laboratories tend to bootleg their printing in a variety of ingenious ways. They want to disseminate, and they want to do it on their own time schedule. The requirement to have print orders filled by the Government Printing Office constitutes an obstacle.

A related oddity is that laboratories are allowed to print reports only in black and white. This, in effect, puts the Office of Education in the position of asking laboratories to develop magnificent products, but to package them in plain brown wrappers.

Recommendation 7: We recommend a relaxation of both of the above policies.

Laboratories are currently experiencing something of an identity crisis. Originally designed as intitutions charged with addressing the problems peculiar to the regions in which they were established, they now have a variety of perceptions of what the Office of Education "intends" and of the degree of initiative that will be tolerated in the matter of role definition.

Several factors have led to the blurring of the laboratories' role. Prominent among these is the closing of five of the laboratories without a clear explanation to those remaining. This has triggered uncertainty and led to a "reading of signs." There is a feeling among some that laboratories serving a national, rather than a regional, role are those most likely to survive. Another guess is that the laboratories that were closed were not developing products fast enough. Both of these two areas of speculation lead to problems.

The "regional vs. national" issue is clouded not only by confusion about OE's intent but by what might be called "two-bossism." One the one hand, laboratories are encouraged to tackle problems of the region, to work in conjunction with local institutions, and to establish and listen to controlling bodies such as boards made up primarily of regional personages. On the other hand, they are evaluated by the Office of Education by persons from outside the region who, in the perception of laboratory staff, have national rather than regional interests and who apply what are considered to be "national criteria."

The "produce or perish" view leads to a feeling that the pressure is for quantity rather than quality and might even be extended into an argument for downgrading the need for quality not only in products but in development procedures. This last, we feel, would be a particularly undesirable consequence.

We have no more idea than the laboratories have as to why some laboratories were closed and do not suggest that any of the foregoing discussion accurately portrays the basis for decisions. We use it to convey the extent of speculation that can develop in the absence of information. The danger is that laboratories may guess wrong about what is expected and move off into unacceptable directions.

Further, we do not mean to imply that there is any basic flaw in the structure of the laboratories or the Office of Education. We say this with some assurance because the stronger laboratory managers are taking steps to define their laboratories' roles in a manner that minimizes the problem of "two-bossism." Increased communication between the Office of Education and the laboratories would ease intensity of what seem to us no more than growing pains.

Recommendation 8: DEL should take further steps to decide what kind of outcomes it desires, ensure that evaluation criteria are relevant to these outcomes, and then communicate this information clearly and explicitly to all laboratory and center staff and to all concerned with the process of evaluation.

We have alluded in several places to the variations that exist in the procedures for testing the output of laboratories and in the amount of concern attached to this aspect of development. One or two laboratories seem content with minimal test information, others talk about it better than they do something about it. Some are giving serious attention to what we would regard as rigorous and relevant procedures.

Recommendation 9: We recommend that DEL commission an analysis of measurement and evaluation procedures, much as it commissioned the present survey of teacher training. The purpose of such an analysis would be served if instead of statisticians or research design specialists, persons experienced in instructional product development were engaged along with experts in formative and summative evaluation. If the analysis be undertaken, we further recommend that the analysis team be given six months in which to complete their work so that they can develop a relatively intimate knowledge of on-going procedures.

The current funding arrangement, extending for only a single year from February 1 to February 1, imposes some hardship on laboratories and centers alike. In part, the problem is the serious amount of time consumed in preparation of program justification, preparation of budgets, and in preparation for and execution of annual evaluation visits. This is not to suggest that planning and budgeting activities and evaluation are not necessary and desirable, but that the present system seems to eat up an unduly large number of productive hours. The possibility of uncovering poor or misdirected output hardly seems justification for saddling all organizations with a difficult system of funding and evaluation. A more concrete problem is the uncertainty introduced into recruiting. A present, it is said that professional personnel must be offered positions at a time of year when budget for the appointment is not yet assured, simply because the season when professional personnel are available (summer-fall) does not correspond with the budget season. (Hunting season is open only when the bears are in hibernation!)

We feel that an increase in the funding period would go far to solve these problems. While the increased period would increase the time between formal evaluations, we are not suggesting that DEL personnel be allowed in a laboratory only once during the funding period. On the contrary, such an arrangement could well encourage a much more intimate dialogue; DEL representatives could visit frequently and informally and learn of activities in a way that is not possible on a formal evaluation visit. They would undoubtedly be more welcome, as special briefings and "spit and polish" would not be required. Too, there is no reason why provision could not be made for special review if output quality became suspect.

Recommendation 10: DEL should identify the laboratories in which it has confidence and then support at least a portion of the operation of these laboratories on a two-year funding basis with a twelve-month cancellation clause. Such an arrangement would provide the budgetary leeway to plan and work effectively. It would probably allow more higher qualified persons to be recruited and retained, and it would insure the kind of program continuity required for sound and often time-consuming developments to take place.

Recommendation 11: We further recommend that if there is an increase in the funding period, and hence in the period of formal evaluation, DEL representatives should increase the number of their informal visits and contacts with laboratories.

Fiscal problems are not all of the order of the one preceding. Some are at a much lower level. There is, for example, a troublesome policy which requires a laboratory director to obtain Office of Education approval for any subcontract exceeding $2,000. Piggybacking on this problem is the further aggravation that getting OE approval of these expeditures seems to take at least 60 days.

Recommendation 12: We feel that if the Office is willing to entrust the laboratory director with control of a million-dollar enterprise, it should trust his discretion to subcontract for amounts equal to at least five percent of the laboratory budget.

There is a law which requires that information-gathering instruments such as questionnaires that are to be used on more than ten U. S. citizens must be cleared. We are told that in practice it takes six months or more to gain this clearance. The problem is that such instruments are changed from day to day as experience with them accumulates. The delay in obtaining approval for each draft constitutes a serious impediment to the speed with which development can be accomplished.

Recommendation 13: We recommend that the law be changed to require that such instruments be submitted in draft form before use, but that use not be delayed while awaiting approval. If a government agency wishes to object to an instrument, surely a rare occasion, let it take the initiative and contact the developer in due haste, rather than delaying all empirical development by requiring all work to stop while approval is obtained.

While professional persons expect to develop and use a variety of skills in their work, it is seldom that an individual is equally highly skilled in all tasks relevant to his profession. Although the scientist is generally skilled in formulating hypotheses and collecting data, for example, he is usually not renowned either for his interest or his skill in communicating his findings to others. This extremely general comment applies quite specifically to many of the laboratory and center documents we have studied. They strike us as quite unnecessarily dull and obscure, violating a basic principle that the reader or viewer should grasp with ease the message intended for him.

Dissemination has had some attention from the laboratories and centers, we feel, since most have a staff member who is, by fiat or by circumstance, "the person in charge of dissemination." The evidence is that this is not enough. There are, in fact, two major steps that might be taken to improve the situation, each aimed at making sure the audience gets the message.

First, dissemination material should be tested on members of the intended audience, precisely as a laboratory's products should be tested during development.

Second, the role and status of "the person in charge of dissemination" should be elevated. It is too easy for a researcher or developer to overwhelm this person with erudition or, muttering about "interference with my important work," send him packing with too little information to do his job. If dissemination is to be effective, the person responsible for communicating with the outside world must have enough organizational muscle to be able to insist on clarity and attention to detail. (For example, although we expected to have to wade through obscurely written documents -- and were not disappointed -- we did not expect so many documents to be undated and minus summaries.)

Recommendation 14: DEL should encurage management to strengthen the impact of the laboratory program by (a) insisting on communication testing of dissemination documents, and (b) by encouraging management to provide those in charge of dissemination with the power to insist on clarity.

APPENDIX A

DESCRIPTION OF SURVEY PROCEDURE

Our initial charge from the Division of Educational Laboratories was to survey and summarize teacher education programs of the fifteen regional laboratories and three research and development centers, and to make recommendations for strenthening the laboratory program.

This was interpreted as an instruction to answer the questions, What are the laboratories and centers doing in teacher training? and, What recommendations can be made to strenghten their activities? From this, we developed a first draft of a list of ten major questions and some 50 probe questions on which to base our report.

Our first list of questions was exposed to three major sources of feedback -- a growing mount of literature, a briefing from a representative of DEL, and a visit to the Stanford Research and Development Center to test a somewhat amended survey guide.

As a result of these inputs, further changes were made in the study guide and once again it was checked with the DEL representative. Yet another pilot test of the survey guide was made through the cooperation of the staff of the Far West Laboratory for Educational Research and Development, Berkeley. We made further revisions -- mainly deletions -- in the survey guide and again obtained approval by the DEL representative before the site visits were made by three team members during the month of June.

The final version of the survey guide covered eight major questions, the answers to which are embodied in Sections 2 through 9 of this report.

The eight headings were subdivided into some 30 other questions. These more detailed questions were designed as a guide to the site visitor, to be used as he saw fit in obtaining answers under the following major headings:

1. What are the laboratories doing about teacher education?
2. What are their problems in getting this work done?
3. What are the results of their work?
4. What are the problems in getting this work implemented?
5. How do laboratories cooperate or compete?
6. What is the extent of duplication? What is NOT being done?
7. Where do they get their ideas, their people? Who are their people?
8. How can teacher education programs be strengthened?

During July, the site visitors' notes were collated and we drafted a description of activities and recommendations. After a review by the DEL representative for comments on readability, comprehensiveness, and priorities, drafts describing teacher training activities were sent to laboratory and center directors for comments, additions, and corrections. Those reactions which appeared to add to the accuracy of the draft were incorporated by us. Those which described activities still in the planning stage, which enhanced our description with jargon which we judged not to be generally understood, or which provided more detail than desired, were omitted. We might mention that all of the directors responded and that comments were gratifyingly few. Only one laboratory was stimulated to record a protest with DEL, and even in that case the proposed changes in our draft report were relatively minor.

The schedule of events was as follows:

EVENT SCHEDULE

1969	
May 16	Briefing by K. Acheson, DEL representative on laboratory background and DEL interests and priorities.
May 16	Visit to Stanford R&D Center to pilot test first draft of survey guide.
May 20	Survey guide revised and checked with DEL representative.
May 23	Pilot test of guide at Far West Laboratory, Berkeley.
May 27	Guide revised and approved by DEL representative.
June 2 - July 3	Site visits scheduled and carried out by V. N. Campbell, W. A. Deterline, and R. F. Mager.
July 7 - July 30	Reports and materials reviewed, notes collated and sifted, and first draft of report prepared.
July 31	DEL representative reviewed first draft report and made suggestions regarding readability and priorities of reader interest.
August 4	Sections describing what laboratories are doing in teacher education mailed to laboratory directors for their comments and corrections.
August 5	Each laboratory and center alerted by telephone that drafts had been mailed.
August 8- August 27	Final draft prepared and edited.
August 27	Report submitted for typing and reproduction.
September 2	Report submitted to Office of Education.

Mazer

APPENDIX B

DEFINITION OF TEACHER TRAINING

To carry out the intent of the project, teacher training programs, projects or activities are defined as those whose primary intent is to change or add to the capability of persons expected to facilitate learning by another (e.g. teachers, teacher trainees, aides, parents, students-expected-to-teach-other-students) through:

1. Workshops or other forms of "direct" teaching or coaching, or
2. Materials (instructional packages or units, products, books, etc.).

They are projects designed to teach persons how to teach, how to use instructional products, or to teach teachers how to teach or to use products.

The definition excludes studies designed primarily to:

1. Contribute to understanding the learning process,
2. Investigate the characteristics of teachers or teacher trainees,
3. Contribute to understanding of relationships between teachers and students, and
4. Change instructional organizations.

Teacher education projects are those which are currently in some stage of development.